THE

Journal of the American Medical Association.

EDITED FOR THE ASSOCIATION BY N. S. DAVIS.

PUBLISHED WEEKLY.

VOL. XI. CHICAGO, AUGUST 18, 1888. No. 7.

ORIGINAL ARTICLES.

FRACTURE AND DIASTASIS OF THE SUPERIOR MAXILLÆ AND UPPER BONES OF THE FACE,

TREATED BY THE AID OF THE INTER-DENTAL SPLINT. WITH TWO CASES.

Read in the Section on Dental and Oral Surgery, at the Thirty-ninth Annual Meeting of the American Medical Association, May, 1888.

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Fractures of the superior maxillary bones are, from their protected location, quite rarely met with except in the alveolar process. The causes of such injuries are usually the result of the extraction of the teeth, or blows or falls upon the chin which separate or split open the walls of the alveoli. This is accomplished in the one case by the lateral force applied in breaking up the attachments of the roots of the teeth, and in the other by driving the teeth upwards and through their alveoli.

Such injuries, however, are never very serious, and rarely require special apparatus to maintain the fractured bones in their normal positions. I shall therefore lay aside all consideration of this class of accidents, and confine my remarks to the more serious injuries of this location, viz.: *Fractures and Diastasis of the Superior Maxillæ and Upper Bones of the Face.*

This class of injuries (which I present for your consideration) have elicited very little attention either by the general surgeon or the oral specialist, and several of the most noted works on surgery make no mention of them whatever. This, I think, is due to the fact that such cases are of very rare occurrence.

Two cases have recently come under my care at St. Luke's Free Hospital, and have led me to make a somewhat careful examination of the text-books and periodical literature bearing upon this subject, and so far, I have been able to gather together but nineteen cases which can be fairly classed as similar to those which form the inspiration of this essay.

Injuries to the bones of the face which cause comminuted fractures and separation from the bones of the cranium, are always the result of great violence; like the passage of the wheel of a carriage over the face, falling from a great height, the kick of a horse, a blow in the face by some heavy missile thrown with great force, or a gunshot wound; crushing of the head between a moving elevator and the floor, the overturning of a carriage upon the occupant, or other heavy crushing force.

Such injuries are always serious and often prove fatal, either from shock, hæmorrhage, direct injury to the brain, or later complications.

In such cases as survive the shock of injury and escape immediately serious complications of the brain, a favorable termination may be looked for, and in many cases with very little deformity. This, however, will depend very much upon the character and location of the particular injury, the success obtained in readjusting the fractured and dislocated bones, and maintaining them in their proper positions.

For the purpose of reference I have grouped together the various published cases which I have found in my search, but shall only mention, very briefly, the extent of the injury and the percentage of fatality.

In speaking of this class of injury, Erichsen[1] says, "In some cases all the bones of the face appear to have been smashed and separated from the skull by the infliction of great violence." He mentions four cases of this form of injury: one reported by South, one by Vidal, and two which came under his own notice.

The injury in South's case was caused by the man being "struck in the face by the handle of a rapidly revolving crank," all the bones of the face were "separated and loosened" and so comminuted as to "feel like beans in a bag."

Vidal's case, also a man, was injured by "a fall from a great height and separated all the facial bones."

Erichsen's cases were both the result of falls from a considerable elevation and striking upon the face. The two former recovered, the two latter died in a few hours.

Packard[2] mentions three cases: one by Cotting,

[1] Erischsen's Science and Art of Surgery, 8th ed., 1884, vol. i, p. 545. [2] Ashurst's Int'l Encyclopedia of Surgery, vol. iv, p. 67.

in which the face was crushed by a cart wheel passing over it; another, brought to the Pennsylvania Hospital, in which the injury was received by the head being caught between the platform of a steam hoisting machine and the floor; and the last one, a case reported by Heath in his "Injuries and Diseases of the Jaws," which was under the care of Dr. Fyffe. The first and last cases recovered, but in the other death ensued in a few hours.

Heath[3] describes two cases: The first came under his personal notice, and was "caused by the passage of a wagon wheel over the face, the bones were completely crushed and separated one from another, and death was instantaneous." The second one is that reported by Dr. Fyffe, and is the same case referred to by Packard, and will be described later.

Tiffany[4] mentions a single case which was reported by Professor Christopher Johnston. The patient, a gentleman, was struck in the face by the walking beam of a steamboat. All the bones of the face were crushed and "seemed literally to consist of a bag of bones moving freely with inspiration and expiration, so extensive was the comminution." This case made a good recovery and an excellent result was obtained by supporting the superior maxillæ, by means of a silver wire passed through the cheeks and under the teeth, and uniting the ends of the wire over the top of the head by a rubber band.

Richard Wiseman[5] published the report of the first case on record, and described the method of treatment. The patient was a little boy 8 years of age, who was, kicked by a horse and the whole upper jaw driven in, so that the finger could not be passed behind the palate. A flattened hook was constructed which could be inserted behind the palate and by extension constantly maintained by the hand of the patient and assistants, the bones were held in place and a good recovery followed.

Dr. Fyffe,[6] of Westminster Hospital, London, has published the report of one case. This patient was thrown from a cab, the vehicle turning over upon him. The superior and inferior maxillæ were fractured, and the bones of the face detached from the skull so that the former "moved up and down in the act of swallowing." This patient also recovered.

Holmes[7] describes a single case, in which the bones of the face were crushed and dislocated by a carriage wheel passing over the face, and in which, after recovery, there "was a disagreeable lengthening of the face" as a result of the injury; but more likely the result of the treatment. Among the methods of treatment suggested are gutta-percha moulds, cork disks placed between the teeth, wiring of fragments and carefully adjusted pressure by the Hanesby truss.

Hamilton[8] refers to one case which came under his own care, in which the upper bones of the face were fractured and torn from their attachments to the cranium, and had to be supported to keep them in place. The patient died on the twelfth day after the injury.

Mason[9] reports a case which was under the care of Mr. Bickersteth, of Liverpool. A gentleman standing upon the deck of a steamer was struck upon the side of the face by an iron hook attached to the hawser, which had parted under a heavy strain. On examination "immediately after the accident, the mouth seemed to be filled by a piece of bloody meat, but on further examination, this proved to be the muscles attached to the upper jaw; the orbital plate of the superior maxilla of the injured side was found beneath the cheek, whilst the palate process with the alveolar ridge and teeth were, for the time, situated in the upper part of the pharynx, looking towards the bodies of the upper cervical vertebræ. The facial surface of the bone took the place of the roof of the mouth, jamming the jaws open. The soft palate was not torn, but considerably stretched. The superior maxilla of the injured side was turned completely upon its axis.

"The detached mass was replaced, the lower jaw firmly closed upon it for support, and the whole rapidly united with scarcely any deformity."

Mr. John Salter[10] reported a case in which the superior maxillæ and malar bones were separated from their attachments with the skull, and so crushed as to feel like a mass of "loose bones."

Dr. Harris,[11] of New York, also reported a case of a little child only 2 years of age, who fell a distance of fifty feet to the pavement, striking upon the face and sustaining fractures and separation upon the median line of both superior maxillæ and palate bones. "Union had not taken place six weeks after the injury."

Mr. Houghton[12] describes a case in which the "superior maxillæ were so fractured and displaced as to make it impossible for the patient to protrude the tongue until after the bones had been adjusted to their normal position."

Bryant[13] mentions one case in which "the superior maxillary bones were completely detached from the skull, and could be moved about in any direction, yet a good recovery ensued."

Agnew[14] mentions the cases of Wiseman, Fyffe and Packard, but describes no new cases.

Garretson[15] reports two cases. The history of

[3] Heath's Injuries and Diseases of the Jaws, 3d ed., p. 59.
[4] American System of Dentistry, p. 568.
[5] Treatise on Surgery, 1734, by Richard Wiseman.
[6] London Lancet, July, 1860
[7] Holmes' Principles and Practice of Surgery, p. 197.
[8] Hamilton's Fractures and Dislocations, p. 102.
[9] Mason's Surgery of the Face, p. 71.
[10] Medical Times and Gazette, June 5, 1869, p. 600, from Mason's Surgery of the Face, p. 70.
[11] New York Medical Journal, vol. xiii, 2d Series, p. 214.
[12] British Medical Journal, Jan. 2, 1858, p. 15, from Mason's Surgery of the Face, p. 71.
[13] Bryant's Practice of Surgery, p. 397.
[14] Agnew's System of Surgery.
[15] Garretson's Oral Surgery, 4th ed., p. 805.

the first was furnished him by Prof. Agnew, in which a lad was crushed between the bumpers of two railroad cars, and sustained diastasis of all the bones of the face from the skull, comminuted fracture of the superior maxillæ, and four fractures of the lower jaw. The patient recovered, but with considerable deformity.

The second case, a painter, came under his own care. The injury was caused by falling from the roof of a house and striking upon the pavement below. He sustained severe comminuted fractures of the superior and inferior maxillæ and fracture of both arms and legs. Several splinters of bone were removed from the anterior portion of the lower jaw, this allowed the parts to fall together "the symphisis of junction being midway between its former position and the hyoid bone." The patient made a good recovery, but with considerable deformity.

SUMMARY OF CASES.

Operator.	No. of Cases	Cause of Injury.	Recovered.	Died.
Wiseman . .	1	Kicked by a horse	1	
South . . .	1	Struck by a revolving crank . . .	1	
Vidal	1	Fall from a great height	1	
Erichsen . .	2	" " " "		2
Cotting . . .	1	Crushed by cart wheel	1	
Packard . .	1	Crushed by hoisting machine . .		1
Heath . . .	1	Crushed by wagon wheel		1
Johnston . .	1	Blow from walking-beam of steamboat	1	
Fyffe	1	Crushed by overturned cab . . .	1	
Holmes . . .	1	Crushed by carriage wheel . . .	1	
Hamilton . .	1	Not stated		1
Bickersteth	1	Struck by iron hook	1	
Salter (John)	1		1	
Harris . . .	1	Falling from a window	1	
Houghton .	1		1	
Bryant . . .	1	Fall from a great height	1	
Agnew . . .	1	Crushed between car bumpers . .	1	
Garretson .	1	Falling from a housetop	1	
Total,	19		14	5

Per cent. of mortality, 26.34.

With regard to gunshot fractures of the bones of the face, the Surgeon-General[16] of the United States reports that from the beginning of the Civil War to October, 1864, there were reported 4,167 cases of gunshot wounds of the face of all kinds. Of this number 1,579 were fractures of the various bones of the face; 891 recovered, 107 died, and in 581 cases the results had not been ascertained. The greatest cause of fatality in these cases was secondary hæmorrhage.

In the Medical and Surgical History of the War of the Rebellion[17] the whole number of gunshot fractures of the various bones of the face is stated as being 4,502; recoveries 3,700, deaths 404, undetermined results 398, and the percentage of fatality 9.8. "The results of shot injuries of the face confirm the opinion that these wounds commonly do well, notwithstanding the amount of destruction apparent at the time of the injury."

The reasons for the apparent lower rate of mortality in this class of injuries is doubtless due to the fact that all forms of fractures of bones of the face have been included in this table. If, however, the more serious cases (similar to those covered by the title of this essay) could be grouped together, I should expect to find the percentage of fatality considerably higher.

With this brief summary of the history and results of the various cases which I have been able to find on record, I will present those which have lately come under my own observation, with the hope that they may prove interesting, and that the means used in their treatment will be helpful and suggestive to others who may be called upon to treat this class of injuries.

Case 1.[18]—Mr. Conrad A., Swede, æt. 28 years, occupation, sawyer, employed at the Pullman Palace Car Works, Pullman, Ill., was brought into St. Lukes's Free Hospital on March 15, 1887, in an unconscious condition, with an incised wound of the right cheek, starting from a point just below the inner canthus of the eye and extending obliquely backwards and downwards a distance of four inches, exposing the superior maxillary bone and completely penetrating the cheek, leaving a considerable external opening into the mouth.

This wound had been sewed up by the surgeon at the Works. The right malar was crushed, both nasal bones were fractured and separated at the naso-frontal suture. The left zygomatic process was fractured near its union with the malar bone, both superior maxillæ were torn loose from the bones of the cranium, so that the whole mass was loose and freely movable in any direction, and suspended by the soft tissues. When the mouth was opened to its fullest extent the teeth of the upper jaw rested upon those of the lower. Both superior maxillary bones were also fractured on a nearly perpendicular line; on the right side between the first and the second molar teeth; on the left, between the second bicuspid and first molar teeth. Openings existed in both antræ. The right could be entered with the probe through the wound in the cheek and also through the alveolar process on the buccal aspect between the roots of the first and second molars, while the left could be penetrated through the buccal surface of the aveolar process on the line of the fracture between the second bicuspid and the first molar teeth.

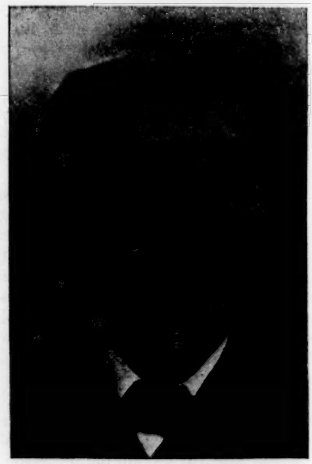
The palate process and palate bones were also badly crushed, forming a compound comminuted fracture, with loss of bone tissue, leaving an opening in the hard palate on the right side near its posterior edge and the median line, through which the index finger could be freely passed. The bones of the internal nose were badly comminuted and several pieces which were loose were removed.

[16] Surgeon-General's Reports, vol. I, p. 289.
[17] Part iii, vol. ii, p. 688.
[18] St. Luke's Free Hospital Reports.

The left side of the face was completely anæsthetic over the whole region supplied by the infra-orbital nerve, while upon the right side the upper lip and the wing of the nose only had lost sensation. The inferior maxilla was not injured and none of the teeth lost by the injury in either jaw.

The accident occurred by the patient being struck in the face by a piece of oak timber 12 inches long and 9 x 8 inches in diameter, which was thrown by a circular saw 18 inches in diameter, and revolving at the rate of about 3,000 revolutions per minute.

When the patient was admitted the chances for recovery seemed very small. Cold applications were ordered over the face, and stimulants hypodermically, if the temperature should fall below normal and the pulse below 60. Nourishment to be given if possible, and ¼ grain of morphia to allay pain.



Case No. 1. Cut. No. 1.—Three years before the injury.

March 16th.—Swelling of parts very great, both eyes closed and nasal passages completely plugged. Pulse 84, temperature 101.8°. Would arouse when spoken to.

May 17th.—Patient has rallied. Pulse 74, temperature 100°. Seems to be conscious. Swelling less.

On the 18th his temperature was normal and did not rise again above that point, and he rapidly improved in general condition from this date.

The treatment of the jaws was begun on the 17th, and consisted of first wiring the posterior fragments of both superior maxillæ to the anterior or middle portion by means of silver wire passed around the teeth on either side of the fractures. The fractured palate bones and the palatine processes were then moulded into place as nearly as possible with the fingers, and the nasal bones lifted into position by means of the handle of an instrument. The lower jaw was then closed upon the superior teeth, care being taken to get a correct occlusion, and held in position by means of an occipito-frontal and occipito-mental bandage.

The following night the patient tore off the bandages several times. The nasal passages being closed he had great difficulty in breathing when the jaws were held tightly together. The bandages were therefore reapplied more loosely, but this allowed the injured bones to fall out of place, and defeated the object in view. This is the plan of treatment usually recommended by such authors as mention this class of injuries, but in my hands it has proved a signal failure, from the fact that the nose was so injured and the parts so badly swollen as to close the nasal passages for several

Case No. 1. Cut No. 2.—Shows condition after union of the fractured bones.

days, and therefore making it impossible to breathe with any degree of comfort except through the open mouth.

There must be considerable difficulty in any severe case in maintaining the position of the fractured and dislocated bones when this plan is adopted, and nearly impossible in those cases in which all the teeth were lost prior to the accident, for it is a well-known fact that as a rule endentulous jaws do not come in contact, and if they should, a normal occlusion would not be obtained, nor the injured parts prevented from slipping out of position. The plan of treatment adopted by Prof. Johnston is also objectionable by reason of the wounds made in the cheeks. In this case I was compelled to devise some other means,

one which would maintain the position of the fractured bone and at the same time leave the lower jaw free, so that the mouth could be open for the purpose of breathing. This was accomplished by adapting the principle of the Kingsley interdental splint to the upper jaw. Impressions of the upper and lower teeth were taken in modeling compound, by first moulding it on the upper teeth and while it was yet soft forcing the lower jaw upward till a correct occlusion of the teeth was obtained. This impression was trimmed to the desired shape and a one-eighth inch steel wire was imbedded in the sides upon a line with the ends of the teeth and then bent backwards upon itself opposite the cuspid teeth, and allowed to extend outside the cheek nearly to the lower border of the ear. From this was constructed a hard rubber splint with the wires attached. The splint was held in position by means of double straps attached to the wire upon each side and buckled to a close-fitting leather cap laced firmly upon the head. This proved to be a very successful appliance, as it held the bones in their proper position, permitted comfortable breathing and free movement of the lower jaw, which enabled him to talk and after a few days to masticate soft food.

Deep indentations were left in the under side of the splint in which the lower teeth fitted accurately when the mouth was closed. The object of this was to furnish a sure guide to the normal position of the upper maxillæ. Without this the correctness of the adjustment of the bones could not have been verified. The importance of this cannot be overestimated. The only other treatment was good feeding and thorough irrigation of the wounds, antræ and the mouth, with a 2 per cent. solution of carbolic acid every two or three hours until the discharges ceased, and the removal of a few spiculæ of bone from the nose and the wall of the right antrum.

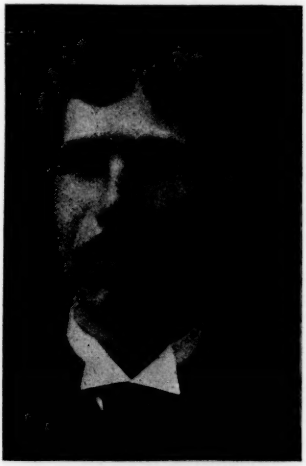
The patient was discharged on May 14th, with small fistulous openings through the gums leading into both antræ at the points of fracture, and a small opening in the hard palate which was gradually growing less. There was also a slight deflection to the left of the nasal septum. The opening into the right antrum soon closed, as did that in the hard palate.

June 22.—Patient returned for the removal of the cicatrix in the right cheek, which was adherent to the maxillary bone.

June 25th.—Stitches removed and the patient discharged.

The opening into the left antrum remained pat-

Case No. 1. Cut No. 3.—Shows the apparatus in position.



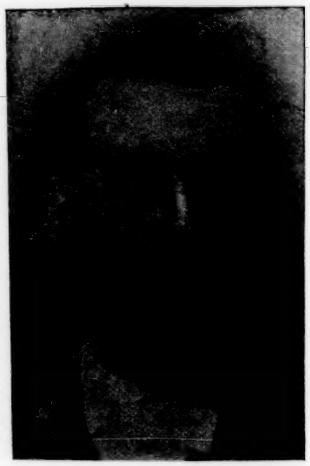
Case No. 1. Cut No. 4.—Shows final result after the operation on the cheek.

ulous for some months, with slight discharge into the mouth, but finally closed. Sensation has been entirely restored in both sides of the face.

Case 2.[19]—Henry S., German, æt. 35, occupation laborer, employed at Armour Packing House. Was admitted Oct. 7, 1887, one hour after the accident, which was caused by being struck across the bridge of the nose by a descending elevator while he was looking up the shaft. Was suffering from concussion of the brain when admitted. Examination disclosed the fact of a lacerated wound over the left eye and extending across the nose to the right eye, the finger could be introduced and readily passed down into each orbit and against the fractured edges of the nasal and

[19] St. Luke's Free Hospital Reports.

sphenoid bones. By taking hold of the upper teeth all the bones of the upper face were found to be movable, and when the mouth was open the the upper teeth rested upon the lower and there was a peculiar and disagreeable elongation of the face. A later examination revealed the fact that the frontal sinus was crushed in, the nasal and lachrymal bones comminuted, and that all the bones of the face were torn loose from the skull on a line passing through the orbits; and that the superior maxillæ were separated from the other bones of the face. The inferior maxilla was not injured. Several loose pieces of bone were removed from the region of the inner canthus of each eye by the house surgeon. The wound was stitched, drainage tubes inserted, the lower jaw bandaged tightly against the upper teeth, and iced cloths ordered over the face and head. Pulse 60, temperature 97.4°. Stimulants administered



Case No. 2. Cut No. 1.—Six years before the injury.

freely. Profuse hæmorrhage occurred during the night, and vomiting of blood every few hours until two o'clock on the following day. He became conscious during the night, but the other symptoms seemed to give but little hope of a final recovery.

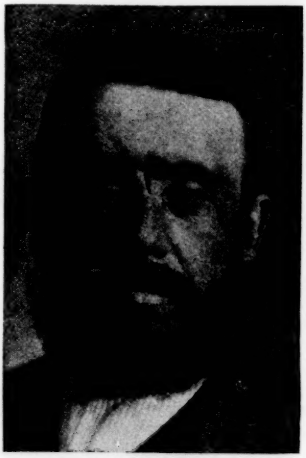
The temperature reached 102.2° on the 8th, at 4 P.M., and fell to normal on the 9th. No brain symptoms developed and the patient rapidly improved in general condition from this time. Swelling and suppuration were so extensive for several days as to render the adjustment of a splint impossible. The treatment consisted of stimulants and thorough irrigation of the wounds. The old method of bandaging was resorted to but proved a failure, for the reason that the lower jaw could not be held sufficiently closed to support the fractured bones in their proper position without obstructing breathing by the mouth. This was necessary as nasal breathing was at the time impossible.

Oct. 24th.—Inserted an interdental splint, constructed after the plan of the one used in the preceding case, and supported it from the head by the same means. The case progressed favorably and was discharged on Dec. 3d, the bones having all united.

Dec. 24th.—Patient returned complaining of double vision. The lens of the left eye looked cloudy and traumatic cataract was feared.

April 1, 1888.—Patient seems entirely well. The double vision complained of has passed away and the lens has cleared up.

From the casts of the jaws in Case 1, it will be seen that the occlusion of the teeth is nearly, if



Case No. 2. Cut No. 2.—Final result.

not quite, normal. And by the photographs taken before the accident occurred (which I have been so fortunate as to obtain in both cases) and those taken since the patients were discharged, that in Case 1 the only deformity visible is a slight flattening of the right superior maxilla and the faint line of the cicatrix resulting from the incised wound in the cheek.

In Case 2 the occlusion of the jaw is equally good but the deformity is greater. This is the result of the loss of portions of the nasal bones and the external wall of the frontal sinus, and the adhesion and contraction of the cicatricial tissue over these places.

No. 9 Jackson Street.

DR. E. S. TALBOT, of Chicago: We have all

listened to Dr. Marshall's paper with unusual interest, as it treats of cases which demand prompt and positive treatment. Great force is required to produce an injury of this nature. Other complications, such as shocks, inflammation and secondary hæmorrhage are liable to ensue on account of the locality. If nature or treatment can overcome these difficulties another serious one presents itself in devising a means to hold the parts in place after putting them in proper positlon, until they have united.

A few years ago I was requested to assist Dr. Powell, of Chicago, in a case somewhat similar to one mentioned by Dr. Marshall. A girl, about 8 years of age, was leaning over an opening in an elevator shaft, head down, when she was struck on the back of the head by the elevator, the face forced to the sill of the building. She sustained a compound fracture of both superior and inferior maxillary bones. The parts were put in their natural position, the teeth being the guide. The jaws were bandaged together in the usual manner. The next morning we found the bandage off, with the bones slightly displaced. This is the point I wish to make: that where a bandage is used it is not certain it will remain in position twenty-four hours. After a little study we concluded upon the following plan, which I believe to be an infallible method of treatment: A skull-cap was made of cotton cloth to fit the head as far as the eyebrows and occipital protuberance. A splint for the inferior maxilla was made of gutta-percha (card-board, tin, or anything that can be moulded to the jaws will do as well). Having placed the pieces of bone in position and brought the jaws together so that the teeth occluded properly, adhesive strips were cut one inch in width, wound and fastened not only to the splint and the skull-cap, but also to the cheeks. The strips were applied in such a manner as to exert the proper force in the right direction. Three or four were then applied. One or two strips fastened to the splint, the cheeks and back of the neck, held all firmly in position.

The patient can be fed with liquids through a rubber tube. Should the teeth be missing, or but a few in position, occlusion would be impossible and the dental splint must be used. The adhesive strips can then be used in the manner described.

SEPTIC DYSENTERY.

Read in the Section on Practical Medicine at the Thirty-ninth Annual Meeting of the American Medical Association, May, 1888.

BY BEDFORD BROWN, M.D.,
OF ALEXANDRIA, VA.

I wish to submit for your consideration some remarks on the history and treatment of septic dysentery as the disease has at different periods come under my observation. Acute dysentery presents itself in two distinct types. One is the simple benign catarrhal form. The other is the grave malignant type arising from septic causes, which has often desolated countries, cities, towns and armies. It may prevail either sporadically or epidemically, and it may be confined to a circumscribed locality to a neighborhood, and even to a single family or household.

Etiology.—Excessive and continuous heat is doubtless the chief predisposing cause of catarrhal dysentery. On the other hand, I think that the facts go to prove that there are other causes concerned in the development of the malignant septic variety which are more preventible and removable in their nature than the effects of solar heat on the human constitution.

I am impressed with the conviction, based upon long experience, that wherever and whenever malignant dysentery prevails, whether in a family, neighborhood, city, or army, there exists in that particular locality a septic cause in the form of unsanitary condition, either in the water consumed, or the air breathed by the inhabitants infected. I believe that when these causes exist in a locality where simple catarrhal dysentery prevails they will be ample to convert the simple into the septic form. Septic dysentery is a contemporary of typhoid and typhus fevers, hospital gangrene and erysipelas.

In armies surrounded by unsanitary influences, in hospitals, jails and prisons with impure air, uncleanly cities and towns, and indeed, wherever there is a bad hygienic state when dysentery prevails, its type will be modified by the existing hygienic influences, either for good or bad. Cleanliness is the fundamental principle of all sanitary science. Purity of air and water and cleanliness in all things—in person, in our homes, our villages, towns and cities, in our farms and barnyards—constitute the best preventive of septic disease. During the prevalence of excessive droughts when the supplies of drinking water are greatly diminished and become impure from the accumulations of putrescent animal and vegetable matter, septic dysentery is exceedingly liable to prevail. This fact was very clearly illustrated in a certain section of Virginia during a devastating drought two years since. It is said that the water of this entire section became impregnated with putrid organic matter. The unsanitary condition of these waters developed a widespread epidemic of septic dysentery of a peculiarly malignant and destructive character, which in point of fatality and rapidity of progress was unsurpassed in the annals of the disease.

During the very hot dry season of 1887 dysentery prevailed epidemically almost universally. In those sections where the sanitary condition was good the disease pursued its mild, simple course. But, on the contrary, in unsanitary locations the malignant type appeared. Some facts of interest bearing on the causes and prevalence of

septic dysentery during the recent war may, I think, be cited here with benefit to the cause of of sanitary science.

In the months of September and October, 1861, a Confederate force of probably 15,000 was encamped on Great Sewell Mountain, in West Virginia, a region famed for the salubrity of its air and purity of its waters. The health of these troops at first was exceptionally good. But when, from want of simple sanitary arrangements, the surrounding country became covered with excrementitious matter, human and animal, and this had been conveyed into the sources of drinking water by excessive rains, a septic form of dysentery, diarrhœa and malignant typhoid fever appeared and desolated the army.

In the autumn of 1862 a Confederate brigade was encamped at Drewry's Bluff, on the James river. An epidemic of malignant septic dysentery appeared during this time, and prevailed among these troops with great severity, and until sanitary measures were taken to arrest it, treatment had but little result.

It was found that the entire surrounding section, having been occupied previously by troops, had become the receptacle of a vast quantity of excrementitious matter which, dissolved by occasional rains, had found its way into the fountains and streams of drinking water and infected the entire command. The surroundings of the encampment were thoroughly cleaned, the sources of water supply were purified, and lastly, sanitary pits were excavated for cesspools at a remote point. Subsequently to this we had occasional cases of dysentery, but no case of the malignant type. We found that the slightest inattention to the laws of health ensured the prevalence of septic dysentery. We found, also, when an army was in motion traversing rapidly new and unoccupied regions, though there were privations from deficient supplies of food, clothing and shelter, the health of the mobilized army improved, and it escaped septic diseases. On the contrary, when troops were confined to close quarters, as barracks or house tents, for a protracted period, septic influences accumulated in these quarters from the exhalations of effete materials from the human body, and the vast deposits of excrementitious matters in the immediate surroundings, which poisoned air and water. Under such circumstances septic diarrhœa and dysentery were liable to appear even in cold seasons, if not guarded against by rigid sanitary measures. A thorough and methodical system, instituted for the purpose of isolating, localizing and disinfecting excrementitious matters, human and animal, to prevent them from contaminating both air and water, afforded more perfect immunity from the prevalence of septic types of disease than any other measure.

It is altogether probable that the orign of a very large proportion of cases of septic disease is due directly to the presence in the water we consume of the poisonous elements of excrementitious matter, both human and animal. In illustration of this statement I will cite an instance which came under my own personal observation more than thirty years since.

A family residing in a most salubrious location, on a mountain top, with delightfully pure air, was attacked with exceedingly malignant dysentery, apparently without visible cause. The prevalence of such a disease in such a locality created surprise, until it was discovered that a privy and a pig-sty had been located in a situation from which drainage into the fountain of drinking water was affected by every rainfall. The different members of this family had been consuming this contaminated water during the season, until their systems were infected by the poisonous matter.

Pathology.—Whether the septic infection in this form of dysentery is conveyed into the system by means of a specific bacterial germ, or by means of the formation of a toxic ptomaine in the dysenteric débris in the intestinal canal and absorbed into the circulation as such, are unsettled questions. But the widespread havoc committed on the entire system in the form of diphtheritic exudations and gangrenous necrosis of the mucosa of the large intestines, hepatic abscesses, adenitis, suppuration and softening of the mesenteric glands, disorganization of the vital properties of the blood, as the corpuscles, fibrine and albumin, softening of the parenchymatous structures, softening of the muscular tissue of the heart, abscesses in different organs, thrombosis, affections of serous membranes, embolic pneumonia and suppurative pleuritis in these cases of malignant septic dysentery, all indicate clearly a septicæmia as profound and caused by a poison as virulent as that of typhus or typhoid fever. These indications are so clear as to be unmistakable, and should afford us a guide to our hygienic and therapeutic management of the disease. Septic dysentery, as observed by myself in military and civil practice, has appeared under three forms, each form having some distinctive peculiarities.

Symptoms.—That type which I shall denominate the malignant, which is the most dangerous, has a decided tendency to pass into collapse at an early stage. The attack usually begins with a chill followed by fever and great general prostration. The fever is usually of brief duration. Extreme depression of the vital functions from the beginning is characteristic of the disease. The temperature in these cases soon falls to a subnormal point. The surface and extremities become cool, clammy and livid. The pulse is small, rapid and feeble. Nausea and vomiting are usually present. The tongue becomes flabby and pale. The discharges are composed of dark, bloody mucus, prune-juice in appearance, and so offensive in odor as to resemble that of gangrenous matter.

In this form of the disease, after the early stages, pain is not a conspicuous symptom and is often moderate. At this stage the evacuations often become involuntary from relaxation of the sphincter. The countenance is pale, haggard, sallow, dull and listless. The patient is exceedingly languid and indisposed to move, to think, or even to respond to questions. He is indifferent to all surrounding circumstances or consequences. If reaction is not established in these cases they often terminate in forty-eight hours. The tendency in all these malignant septic cases is to gangrene and necrosis of the inflamed mucosa. The presence in the inflamed intestine of these diphtheritic exudates and gangrenous sloughs when undergoing the putrefactive process must generate a toxic material that is capable of producing a virulent septicæmia when absorbed into the circulation.

The Hæmorrhagic Form.—I have observed a dangerous form of septic dysentery accompanied with such decided hæmorrhagic symptoms as to entitle it to that term. In these cases in the early stages the evacuations are muco-sanguineous. But very soon these are accompanied with considerable and exhausting hæmorrhages, composed of a dark-colored fluid blood which has no tendency to coagulate. These hæmorrhages, in more or less quantity, occasionally amounting to as much as twelve ounces, recur at intervals during the attack, and are very exhausting. These hæmorrhagic discharges often contain mucous, diphtheritic exudations and sloughs. They doubtless are due to the breaking down of gangrenous tissue and rupture of vessels of some size. This is, in my experience, one of the most fatal varieties of dysentery. The vital prostration in this class of cases is always extreme and much resembles in general features the malignant grade of typhoid fever, excepting the conditions of the mental powers, which usually remain clear until the last. Even when the frequency of the pulse reaches 150, the extremities and surface cold, and the thermometer indicates a subnormal temperature, the mind is often unaffected. I have only seen this form of dysentery occasionally during the prevalence of very malignant epidemics.

The adynamic type of septic dysentery begins with tormina, tenesmus, and frequent muco-sanguineous discharges. The attack is usually ushered in with distinct chill, followed by fever, but not of a high grade. Very early in the attack adynamic symptoms make their appearance. The tongue becomes dry and brown, the abdomen tympanitic and tender on pressure. The pulse is always frequent and feeble. The temperature rarely exceeds 104°. Delirium is an early and marked feature. The evacuations consist of very offensive, thin, bloody mucus. Patients in this peculiar, somnolent delirium often lose control of the bowels. This form of dysentery is usually somewhat protracted. It not unfrequently continues from two to four weeks.

Treatment.—In the treatment of septic dysentery there are several important objects to be considered. To remove systematically from the intestinal tract all infectious fæcal and dysenteric matters; to disinfect that canal; to sustain the depressed nervous and circulatory systems, and replenish the poisoned blood, are leading considerations. The primary object is to clear the intestinal canal thoroughly of all accumulations that might prove a source of infection. A ten grain dose of the mild chloride of mercury combines the properties of a thorough cathartic with decided antiseptic powers. In the malignant or collapsed form the tendency is to sink down into speedy and hopeless collapse. It is necessary to counteract this tendency by prompt measures, and to establish reaction by the use of the most potent cardiac and nervine tonics and stimulants. At the same time active disinfection of the intestinal tract should be practiced. I have found a combination of brandy and port wine in equal parts act well as a restorative. Of therapeutic agents the most effective stimulant in my knowledge is found in the following combination:

℞. Morph. acetatis. . . . . gr. ij
Strychnia. . . . . gr. ss
Ext. belladonna . . . . . gr. ij
Bismuth salicylate . . . . . ʒ ij
M. ft. pil xxiv.

A pill is to be taken every three hours. In connection with this the one-hundredth of a drop of nitro-glycerine, in granules or solution, should be given every alternate period or interval, until the tendency to collapse is corrected, and reaction is established. In cases attended with great prostration these agents tend to strengthen the action of the heart, contract the relaxed arterial system, increase arterial tension, correct general relaxation, tone up the depressed nervous system, and above all others, to arrest collapse.

In a case of this kind occurring during an extensive epidemic in September last, in which case there was early tendency to collapse, manifested in extreme vital prostration. The patient was lethargic and somnolent. The surface was cold and clammy. The thermometer indicated a temperature under the tongue of 96½. The pulse was scarcely perceptible and exceedingly frequent. The patient had lost all desire for food or drink. After the failure of all possible diffusable stimulants, the above combination of remedies was resorted to with the effect of restoring reaction. In another case, accompanied with exhausting hæmorrhage and collapse, the same remedies established reaction. When this has been accomplished and this class of remedies can be dispensed with, then sulphuric and hydrochloric acids in combination may be resorted to with advantage, in the following manner:

℞. Acid hydrochloric, dil. . . . . ʒ ij
Acid sulphuric, dil. . . . . ʒ ij
Aquæ . . . . . ℥ v
Syr. aurantii cort. . . . . ʒ ½
Tinct. opii deod. . . . . ʒ ij
m.

A tablespoonful diluted every three hours exerts a decidedly tonic and antiseptic effect in these cases The chlorine and sulphur held in solution in these acids imparts to them an antiseptic and germicidal power possessed by few other agents. Septic condition of the intestinal canal indicated by tendency to gangrene and sloughing, diphtheritic exudations, putridity of dysenteric débris, manifested in the intensely fœtid discharges, and those symptoms of general septicæmia resulting from the local disease, call for local antiseptic treatment.

Antiseptic irrigation becomes as much a necessity in these cases, to prevent or arrest general infection of the system, as in the septic puerperal uterus, and is based upon the same principle of removing all infectious débris, and disinfecting the diseased organ. The absolute importance of the disinfectant treatment of local diseases has only been appreciated as a means of preventing constitutional infection, since the nature and action of sepsis has been understood. The principle applies with equal appropriateness to the study and treatment of the malignant septic forms of dysentery as to other kindred affections.

The first antiseptic irrigation practiced should be composed of warm water and carbolic soap, or, in other words, carbolic soap-suds. This always cleanses the entire tract thoroughly, and not only affords comfort, but produces a change in morbid action. Subsequently antiseptic irrigation should be continued by means of a solution of the peroxide of hydrogen in an 8 per cent. strength. While my experience with this remedy as an antiseptic in this affection is limited, this experience has been so favorable that I am compelled to regard it as one of the most effectual antiseptics and disinfectants known. At the same time it is free of danger. Thrown into the large intestine in malignant dysentery, it arrests putrefaction in the débris of broken down tissue and discharges, corrects fœtor, prevents infection, and exercises an important influence in cleansing and healing the ragged and unhealthy ulcers left in the mucosa of the large intestine after the separation of sloughs.

I find that the best method of conducting antiseptic irrigation in these cases, to reach all diseased parts, is to place the patient in the knee-elbow position, and insert in the rectum a flexible tube, through which the enema is given by Davidson's syringe. Or, if this is not practicable, then the patient is placed on his right side, to permit the irrigating fluid to pass through the arch of the colon. Boracic acid in a 5 per cent. solution is also a good antiseptic for irrigating the bowels in septic dysentery. In the treatment of the hæmorrhagic form and the more protracted adynamic type, when the system has been subjected for a length of time to the prostrating influences of septicæmia, these irrigations, practiced systematically, always modify the local disease and improve the general condition. It is in this form of disease that I have found certain styptic solutions of iron so valuable. The solution of the pernitrate of iron ʒss, aqua ʒv, simple syrup ʒss; or the tinct. of the chloride of iron ʒss, aqua ʒvj, syr. limonis ʒss, acid phosphoric dil. ʒiij, in doses of a tablespoonful, combined with 10 or 20 drops of the deod. tinct. opium, every three hours, are admirable tonics to the general system, and alteratives of value on the local affection.

In the hæmorrhagic tendency or in those cases with copious, thin, offensive discharges of bloody serum, these preparations are of peculiar value.

The oil of turpentine in teaspoonful doses in emulsion is also appropriate in the treatment of these cases, given three times daily.

The use of Cathartics in Septic Dysentery.—I regard the use of certain cathartics in this form of dysentery as eminently necessary to carry out in full the principles of antiseptic treatment. We must not only apply chemical agents to arrest the process of sepsis, but also use means to remove the prime causes of infection. In cleansing a cesspool we must not only disinfect its contents, but remove them, so that there may be complete isolation to prevent infection. Almost invariably following the action of a cathartic, mercurial or oleaginous, there is improvement in the general and local symptoms. The symptoms of septicæmia and constitutional suffering improve, while the tormina, tenesmus, nausea and vomiting, abdominal distension, and frequency of intestinal action, diminish for the time, and often permanently. Now what is the rational explanation of this therapeutic result? It is simply that all septic fæcal and animal matter that might infect the system has been removed. In the beginning of treatment, as an antiseptic cathartic a 10 gr. dose of the mild chloride of mercury is superior to all others. But the castor-oil and turpentine combined with 10 drops of tinct. of belladonna given occasionally, subsequently, is the most thorough in its action in removing all accumulated matters with the least injurious results. In removing this putrid infectious matter we are aiding materially the great cause of antisepsis.

In the adynamic type of cases occurring during the epidemic of the past season, accompanied with low grade of fever, dry tongue, quick pulse, delirium, offensive, dark discharges, tympanites, with indications of septicæmia, in conjunction with the local disinfection, I used with much benefit a combination of quinine and antifebrin, of each 2 grains every three hours, and 5 grains of naphthaline, or naphthol, at equal intervals.

I am constrained to believe that in these ma-

lignant septic cases of dysentery we do not always realize the extent of the depressing influence on the vital functions of the existing septicæmia. Neither do we always appreciate the importance and necessity of the use of nutritious stimulants and restoratives in this class of cases. I am impressed with the conviction that many of these cases go down from want of attention to this question.

Thirty-five years ago, in an epidemic of malignant dysentery that came under my observation, the most of the bad cases which recovered were saved by the liberal use of stimulants, nourishment, an occasional mercurial cathartic, and anodynes. Some of these patients, who were threatened with collapse, consumed as much as twelve ounces of brandy per diem.

We must not depend alone on antiseptics and tonics to relieve septicæmia. New blood must be made, to repair the decay of the old. And the tissues, which are undergoing rapid disintegration, must be renovated, or death will ensue. This can only be accomplished by the use of every means to sustain the system, the constant tendency of which is to sink down into collapse. In this form of dysentery there exists a dangerous blood depreciation, that renders the use of the most concentrated stimulants necessary. Milk punch, milk, eggs and brandy, or egg-nog,[1] beef tea made with lean beef and barley, Scotch broth prepared with lean mutton and barley, constitute valuable aliments in this affection. In diseases with great vital depression and loss of digestive power, we should shape the preparation of food so as to make it as tempting as possible to the palate which relishes nothing, and as digestible as one can prepare it.

Opiates in this, as in other forms of dysentery, cannot be dispensed with for the relief of pain and to procure needed rest. But their reckless employment for the prolonged suppression of the discharges is, in septic dysentery, not unattended with danger. After the action of a cathartic, when the alimentary tract has been cleansed of its septic contents, and secretions restored, then is the proper time for the administration of opiates. On the other hand, opiates should be followed by cathartics for the removal of all fæcal and animal matter that for the time may have accumulated. We should never lose sight of the fact that dead animal matter, whether in the uterus, puerperal or non-puerperal, in the bronchial tubes, in the pleural cavity, in tuberculous cavities, in the bladder, in the cranium, or in the intestinal canal, when retained sufficiently long to undergo decomposition, generates infectious matter that will endanger health and life. Here is the principle that should guide us in the administration of opiates. They are astringents of the first order, and when injudiciously used may lock up in the intestinal canal, which is in truth the great sewer of the system, matters that are constantly undergoing decomposition, and generating septic material of a deadly poisonous character.

Some years since I witnessed an instance in which a rapidly fatal case of septicæmia, accompanied with peritonitis, occurring in a simple case of catarrhal dysentery, resulted from the continuous use of opiates for forty-eight hours, which caused retention of putrescent matter in the intestines. In this case there was speedy generation of septic matter in the intestinal canal from suppression of discharges, supervention of symptoms of septicæmia, and finally peritonitis.

[1] A further experience in the use of the favorite American drink, *egg-nogg*, as a diet and nutriment in adynamic types of dysentery, is superior to all others. During the present season I have, by this nutriment alone, sustained for many weeks some of the most malignant cases, both in adults and young children. In two cases of this kind life was sustained alone by this diet during most dangerous attacks lasting six and seven weeks.

NOTE ON THE TREATMENT OF CATARRHAL INFLAMMATIONS OF THE UPPER AIR-PASSAGES.

BY ELY McCLELLAN, M.D.,
SURGEON UNITED STATES ARMY.

Early in January of the present year, I was asked by a patient to call on Dr. T. F. Rumbold, of St. Louis, Mo., and obtain some information as to a case which had formerly been under his care. At the time of my visit I had no knowledge of Dr. Rumbold's specialty or of the valuable therapeutic methods he has originated. I was suffering at the time with catarrh, which was increased by a "bad cold," while my malaise was intensified by physical prostration attending severe and prolonged over-work.

In the course of our conversation, Dr. Rumbold noticed my condition. An examination followed and a treatment was offered which I was glad to accept, though no flattering assurances were held out. The sense of relief which I obtained from the first application was most grateful and encouraging. I placed myself under Dr. Rumbold's care, and the results obtained in the amelioration of my distressing symptoms filled me with new hope. True I have not been free from the necessity of occasional applications. The accession of fresh colds require treatment, yet comparing my condition to-day with what I was mentally and physically six months ago, I am restored to my original optimism.

Up to the date of my visit to Dr. Rumbold, I had treated myself carefully, assiduously, and with the most approved appliances, but only to encounter constant disappointments which forced upon my mind the fact that so far from improving my condition I was constantly growing worse. From Dr. Rumbold I obtained, not only relief from my distressing symptoms, a reasonable

prospect of a more comfortable existence, but the knowledge of a practicable and thorough method by which, at least relief, can be extended to all cases of nasal catarrh.

Encouraged by the success that attended the treatment in my own case, I resolved to extend my experience in the treatment of both acute and chronic inflammations of the upper air passages. I am on duty at a depot for recruits, where large numbers of men are constantly arriving. These men come from all classes of life, and very many of them are directly influenced by the abrupt climatic changes to which they have been subjected, thus affording an excellent field for extended experiment. The results gained may be briefly stated. In a considerable number of cases of acute inflammation of the upper air passages treated by the Rumbold method, the attack in the majority of cases was aborted; of those remaining the severity was greatly mitigated, while in but one case did the disease resist treatment, and the inflammatory action result in suppuration. In all chronic cases treated the advantages of the method were equally apparent. Each succeeding case demonstrated the exactness and facility with which the cleansing process is accomplished, and the thoroughness of the application to the inflamed surfaces, and the encouraging results thereby obtained.

I do not propose in this paper to proceed to any exhibition of cases, but simply to present a statement of the therapeutic measures that have been instituted, successfully practiced, and presented to the profession by Dr. Rumbold, the efficacy of which is well known and recognized in his place of residence, but which as yet is but little known or talked of in the great medical centres.

In the treatment of the inflammatory conditions that result in rhinitis and its sequelæ, as well as in the defined stages of the disease, it is recognized as the first essential to the successful treatment that the abnormal secretions be removed from the mucous surfaces, and that having been accomplished, the second step, which is of vital importance, is the application of suitable medications to the cleansed surfaces. The difficulties in the way of filling the first indication are well-known to all those who have made the attempt. Success demands that every portion of the nasal, pharyngo-nasal cavities, as well as the pharynx and larynx, shall be cleansed. This difficult procedure having been accomplished, the second essential to the cure presents itself. A remedy or series of remedies must be selected by which the inflammatory action may be subdued without inflicting a lasting injury upon the mucous membrane.

Water is the medium generally employed to meet the first indication, but as water *per se* is an irritant to the Schneiderian membrane the attempt is made to render nugatory its physiological action by the presence of one or more of the salts or of other agents. This application is accomplished by the nasal douche, syringes, or by the various spray instruments, by means of which a greater or less flow of medicated water, governed by a greater or less propelling power is made to flow through the choanæ, by gargles and by the use of probangs and brushes applied through the mouth.

The question of importance is, do these procedures absolutely clean the membranes of the nasal chambers? Does the cleansing fluid reach to the superior and posterior surfaces of the nasal and pharyngo-nasal cavities? Does it remove all the secretion which may be present, or does it simply tunnel out for itself a channel through which it may unobstructedly flow?

My own impression based upon an experience of many years, is that the upper air-passages can never be thoroughly cleansed by a water douche of any kind unless a very large quantity of the fluid be used, and without its being applied with a force which must be hazardous to the integrity of the mucous membrane; and one is forced to the conclusion that because the nasal cavities in the subjects of chronic inflammation have not been absolutely cleansed from the abnormal secretions by the methods most generally advocated, nasal catarrhs are classed as intractable, and have become an opprobrium to the general practitioner. Nor are probangs armed with sponges, absorbent cotton, or swabs of linen or cotton fabrics, or brushes of Camel's-hair more efficacious when applied from behind the soft palate. To detach a mass of tenacious mucus from an inflamed surface by the application of force is a laborious and oftentimes thankless task, and when accomplished it is almost always at the expense of the tissue from which it is detached. The gargle is now considered obsolete and useless when applied for such purposes.

To Dr. Rumbold is certainly due the credit of having devised means and apparatus by which a complete cleansing of the entire surface of the nasal and pharyngo-nasal cavities may be accomplished, with comfort to the patient and to the entire satisfaction of the operator. The menstruum employed in the cleansing process is vaseline warmed to liquefaction. The application is made by metal spray producers armed with a cup large enough to hold a drachm of melted vaseline. The force applied in the application is compressed air, either from a rubber hand bulb or from a fixed receiver for compressed air. The force of the compressed air is in no case to exceed a pressure of seven pounds to the inch. To make a successful application four spray producers are required. One, by means of which the warm spray is thrown into the nostrils, and by movement of the instrument is made to reach every portion of the nasal cavity. A second, in-

troduced behind the soft palate sprays the pharyngo-nasal cavity. A third, also passed behind the soft palate cleanses the posterior nasal cavity, throwing the spray under the inferior, middle, and superior turbinated processes. A fourth, cleanses the fauces, the tonsils and the lower portions of the pharynx.

It is an assured fact that the warm vaseline will readily detach all mucus however inspissated it may be from the walls of the upper air-passages. A careful examination after each application will always discover the inflamed mucous surfaces free from secretion and covered with a thin coating of the vaseline.

The mucous membranes having been cleansed from abnormal secretions the remedies remain to be selected by means of which the inflammatory action may be arrested, and the tissues may be restored so far as may be possible to their normal condition. The application of medicated inhalations have been practiced since the days of Hippocrates and Galen, and almost endless are the agents which have been from time to time adopted, lauded, but finally abandoned. Delavan writes on this subject: "At present so many different therapeutic methods are proposed and strongly advocated by good authorities, that it is impossible to refer to any as established."

The majority of agents recommended are, strictly speaking, irritants to the mucous membranes. It is well-known that water itself is an irritant, and yet water is the vehicle almost invariably employed. It is significant when we read Eichhorst's statement, when treating of chronic catarrh, that "the treatment is discontinued for a few days if pains and violent inflammation develop." Prosser James continually calls attention to the necessity of not causing irritation by the strength of solutions so employed. Bellamy recommends the employment of "weak solutions" by the nasal douche, and instances might be further quoted showing the growing tendency to the abandonment of heroic treatment in the diseases of the throat and nasal cavities, although the galvano-cautery is still at the head of the procession.

The departure of Dr. Rumbold from the established line of practice for the successful treatment of catarrhal inflammations of the nose, throat and ears is best announced in his own words. In the treatment of all such cases, the following is positively indicated.

1. Non-irritating agents only should be used.
2. The means of making these applications should not produce the least irritation.
3. The whole of the irritating catarrhal secretion should be removed.
4. The agent employed should have sufficient solidity to remain for several hours on the inflamed surface to protect it as much as possible from the irritating influence of the air, and it should possess also such properties as will prevent the future secretions from becoming acrid.

As essentials to perfect success it is insisted that, every portion of the diseased surfaces within the nasal and pharyngo-nasal cavities must be treated. That force enough must be exerted to remove all morbid secretions from the diseased surfaces, but that an excess of force must be avoided. That the medicament must be applied quite warm.

A long experience has led Dr. Rumbold to the selection of the following remedies as those from which the most constant beneficial results are to be obtained, viz.:

1. Vaseline pure.
2. Vaseline with eucalyptol.
3. Vaseline with gaultheria.
4. Vaseline with carbolic acid.
5. Vaseline with pinus canadensis.

The applications to the nasal and pharyngo-nasal cavities are made with all the remedies, with the exception of the gaultheria and the pinus canadensis. The two remedies last named are applied only to the larynx and to the pharynx.

The applications are made at intervals of from twelve to twenty-four hours, until the severity of the symptoms are relieved, and then every fourth or fifth day.

Constitutional treatment is also necessary, but a consideration of that subject does not come within the scope of this paper.

Jefferson Barracks, Mo., July, 1888.

A NEW CLINICAL SPHYGMOGRAPH.

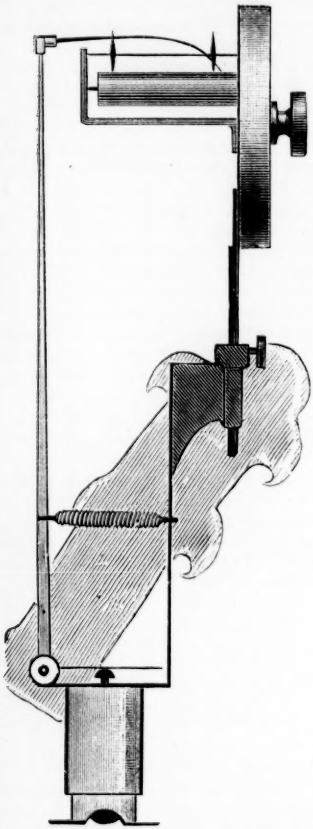
Read by title in the Section on the Practice of Medicine at the Thirty-ninth Annual Meeting of the American Medical Association, at Cincinnati, May, 1888.

BY ROBERT T. EDES, M.D.,
OF WASHINGTON, D.C.

The defects of the different forms of sphygmograph in use are so well known to those who have worked with that fascinating, but capricious instrument, that I will not formally set them forth, but advert to them in connection with the description of the devices employed to avoid or minimise them.

This sphygmograph consists in a base composed of a piece of metal tubing with a broadened foot, sliding within another, and supported by a pretty stiff spiral spring. This slide and spring are intended only for the support of the instrument and regulation of the pressure, but in no way for *measuring* the pressure. Within this base moves the pad or plunger with a stem. The top of the stem bears against the arm of a bent lever, the long or writing arm of which is made of wood for the sake of lightness, and which carries on its summit the writing needle. The smoked paper is carried horizontally under the needle and receives the trace.

Pressure is made by a fine spiral spring attached to the long arm of the lever.



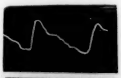
Some of these points will be better understood by reference to the well-known sphygmograph of Pond, which has been so largely used in this country and commended abroad, and which is undoubtedly for clinical purposes (when applied without the arm rest) much the most convenient (unless Dudgeon's, which I have not used, be an exception).

This instrument resembles Pond's in the sliding base, the upright lever, and the horizontal paper. It differs in the omission of the India rubber membrane which has so many defects to counterbalance its one merit of convenience. It deteriorates and loses the essential property of a spring, elasticity; when renewed it can never be adjusted twice alike; and most important of all, it carries a certain, or rather uncertain, proportion of the pressure made by the wide base upon the neighboring tissues over to the pad, so that the graduations on the sliding stem can never represent the pressure on the artery alone, but on the neighborhood, and especially on the radius and the tendon of the flexor carpi radialis. These criticisms may not apply to the other form of base used with the Pond.

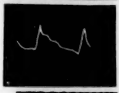
The lever in this instrument is but one, and there is no arrangement by screw or otherwise for adjustment of the pad to the writing levers to suit different degrees of the pressure.

FROM THE SAME PULSE.

Marey. - - -

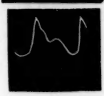


Pond. - - -



As taken by new Sphygmograph.

Same, magnified vertically and reversed.



As a result of this we have one apparent disadvantage and several real advantages. The latter are: First, that the position of the tracing upon the paper is itself an indication and record of the pressure upon the artery, so long as the spring remains the same. Any given pressure exerted upon the pad will always draw the needle to the same place. The pressure may be varied while the paper is in motion, and its effect on the tracing thus becomes evident; or what takes but little more time, and is more elegant, several tracings at different pressures may be taken on the same slip. This implies, as one familiar with the instrument will at once notice, a much diminished amplitude of motion in the writing point. The tracings do not to the naked eye present the ordinary appearance, but look like the very feeblest to be taken with any of the other forms. Second, the diminished motion of the lever removes one source of error which has always been recognized, and which has been partly avoided in Marey's by connecting the two levers, but which remains in Pond's owing to the weight of the upper lever and counterpoise. It has even been exaggerated in a very sensitive and beautiful instrument made under the direction of Dr. Hopkins, of Buffalo. This source of error is the acquired velocity of the moving parts, which may carry the point beyond the level to which it comes

by the action of the artery, thus making the elevations higher and the depressions lower than they should be. I cannot see why this instrument, leaving out the error of friction, should not give an absolutely faithful transcript of the curve which is described by the surface of the artery.

Errors due to looseness of joints are also avoided.

The want of distinctness in the tracings would, however, be far more than an offset to all these advantages; would, in fact, make the instrument almost worthless, if it were not for a device never before introduced into sphygmography. It is not original with me, but depends upon a suggestion from my ingenious friend, Dr. William P. Bolles, of Boston. It is the use of a cylindrical lens for reading the sphygmograms. This multiplies the amplitude of the tracings in the vertical direction about three times (or a stronger one might be used which would give four or five). The tracings which had before had so little variation in level as to seem meaningless, at once assume the appearance which will be recognized at once as corresponding more or less nearly to the common form.

The lens I have employed is composed of two of the strongest plano-convex cylindrical glasses, having together a focal length of 5 cm. They were procured for me square, that is before being mounted in the round frames in which they are supplied to test glass cases, by my friend, Dr. Swan M. Burnett, and mounted with the plain surface in apposition.

With the arrangements as now made which could obviously be varied considerably, the lever (short arm .9, long arm 10.2), amplifies about 11 times and the glass three or more, according to its position, thus giving 33 in the whole, or about that of Pond. $\frac{\text{Product of long arms}}{\text{Product of short arms}} = \frac{4.0 \times 3.0}{4 \times 9} = 33.3$.

With the strength of spring used the pressure needed to start the writing, or to make the needle write near the lower edge of the paper is 30 grams; near the upper edge 90; and in the middle 50 to 75. This range seems to be sufficient for ordinary pulses, but it will probably not cover the whole range required for exceptional cases. It certainly will not admit the high range spoken of by Marey and Burdon-Sanderson, but on the other hand, Brondel says it is very rare that pressures of 80 and 155 are required. It would not be difficult to have a second spring to be used in exceptional cases, or even for the higher range of pressures, so that the tracings might be written on two scales, like the two staffs for music, instead of on an entirely indeterminate one as at present with the adjustable instruments. The higher scale may also be obtained by shifting the spine to a higher position on the lever.

The manner of holding and applying an instrument I believe to be of no little consequence. It is the ease of management and little trouble of the Pond, when used without the rest, which have made it so deservedly popular. The pads and straps of some of the others are sufficient to prevent their being freely employed, and thus acquiring a real clinical value, and I knew of an instance where the use of the Pond was nearly abandoned in a hospital, because it could not be made to work with the arm rest. I believe the almost trivial device employed with this instrument makes this even more convenient than the Pond.

This is a slip of metal connecting the base with the upright that carries the clock-work, and acting as a brace, which is so curved, and supplied with side pieces as to fit on the fore finger. The instrument is thus carried on one finger, while the middle finger can feel the artery if desired. While the instrument is applied, the thumb can stop and start the clock-work, and the left hand is free to introduce and receive the paper; or be itself the object of examination.

I submit a number of tracings which may be examined with two or three of the highest cylindrical lenses to be found in the test case of the ophthalmologists. They are not intended to illustrate types of disease, but simply to show the working of the instrument. It will be noticed that they read in the opposite to the usual direction. This is because the clock-work of a Pond's sphygmograph, made to work with a different arrangement of levers, was used. If a new piece of clock-work were made it would, of course, be arranged to run in the usual direction.

GRADATION OF LENSES.

Read in the Section on Ophthalmology at the Thirty-ninth Annual Meeting of the American Medical Association, at Cincinnati, May 8, 1888.

BY DUDLEY S. REYNOLDS, A.M., M.D.,

PROFESSOR OF GENERAL PATHOLOGY, HYGIENE, AND DISEASES OF THE EYE AND EAR, IN THE HOSPITAL COLLEGE OF MEDICINE, MEDICAL DEPARTMENT OF CENTRAL UNIVERSITY OF KENTUCKY, LOUISVILLE.

The lenses employed for testing refraction, as they are obtained from the best makers, are graded by three separate systems, namely: by focal lengths in inches, by focal lengths in metres and centimetres, and by the radius of curvature, on the basis of a unit representing the maximum angle of retraction, which, according to the old astronomers, is equal to the quadrant of a sphere, or 90° of its circumference.

A series of lenses constructed of crown glass, having an index of refraction of about 1.53, each lens representing a definite fractional part of the unit, may be said to represent the only scientific series of lenses, because these are graded into such fractions as to represent a definite angle of radius, as, for instance, the most powerful convex lens in the

series in ordinary use is one-half, and represents, not, as some suppose, 2 inches of focal length but, in fact, 45° of radius of curvature, or half the unit of astronomical refraction.

Now, some recognition must be given to the size of the disc represented by the circumference of the unit, or the lens whose refracting angle represents 90°, may be wholly unsuited to the purposes intended. To arrive at uniform results, it is manifestly clear the instruments employed should be identical, and all the conditions governing the process precisely uniform. To establish a standard series of lenses, Vitileo and Baptista Porta constructed spheres of crown glass and, by experimental tests, were able to determine that the maximum angle of refraction of light falling upon the surface of such a sphere equalled one-fourth of its circumference, or 90° of its radius. A separate lens, so as to represent the same amount of curvature, it was found would focus light at a distance nearly equal to one-half the diameter of the sphere from which this segment was taken; that is to say, light passing through such a segment, united at a point distant from the nodal point of the segment itself equal to one-half the diameter of the sphere of the same radius.

Now, if a sphere 2 inches in diameter, and another sphere 3 inches in diameter, be taken for experiment, it will be found that the focal length of the quadrant of the first sphere will be about 1 inch, whilst that of the second will be about 1½ inches; so that any attempt at grading lenses by focal lengths must necessarily be utterly unavailing for scientific purposes.

Few who have not made the experimental test would be inclined to recognize the difficulties attending the measuring of the actual focal lengths of lenses. If a dark box, into one end of which the skylight, through an open window, is allowed to pass, the intercepting lens will, if the box be small, collect and refract only the central portion of the pencil of rays entering it, and the result will be, if the light be bright, a stronger penetration and greater focal length will be registered than might be obtained by making the test with a series of points, of artificial light taken from a white or frosted background. If a large box be used—always presuming, of course, that the lining of the box shall be perfectly black, with a dead finish, so as to prevent reflection—so much light will have been absorbed before the focal point has been reached that it will be exceedingly difficult to define the focus, and, therefore, errors of 2 or 3 inches in measuring are commonly committed. If there be any asymmetry in the grinding of the lens, this will not appear in such a test. If two dotted lines, intersecting each other at right angles in the form of a cross, be employed, more definite results can be obtained, because, if any one of the dots in either of the two crossed lines should appear of irregular form on the polished side of the frosted glass register, it would at once show asymmetry in that part of the lens; and if, by revolving the lens, it should turn out that points in corresponding portions of the several lines were distorted, the asymmetry of the lens would thus be established beyond doubt, and might even be designated by a mark on the surface to show the precise part defectively ground.

If any coloring matter be present in the glass, it will cause halos in certain portions of the field represented by the dotted lines on the frosted glass register. To make this test, of course it is necessary to have an instrument constructed with an opaque metallic disc, perforated by circular openings across the centre, and on the face of the disc another line formed in a similar manner, at right angles to the first, so that they shall cross exactly in the centre of the disc. Against the surface of this perforated metallic disc a piece of frosted glass should be placed. A lamp flame or a gas jet will furnish the best source of illumination. Having a positive lens between the source of light and the perforated disc, uniformity of illumination may be secured. The lens to be tested should then be placed in a clasp on a beam, supplied with an arrangement for sliding both the disc containing the perforated plate and another frosted glass disc at the opposite end of the beam, upon the surface of which the points of light refracted by the lens being tested, at the centre, are collected. On the surface of the beam, from the centre to the distal end, the different points at which the light is focused on the registering or collecting disc may be marked in a scale, which shall be used for the determination of the refracting powers of spectacle lenses, or other lenses of similar character, which it is designed to measure. Snellen's phakometer fulfils these indications, and is, in its improved form, the most accurate and satisfactory instrument for determining the quality and the refracting powers of lenses, whether spherical, cylindrical or compound, yet devised.

In his preface to the English translation of Scheffler's "Theory of Ocular Defects and of Spectacles," Prof. Brudenell Carter, of London, says: "It is well known that much dissatisfaction has been felt with the irregular intervals between the lenses in the test-cases commonly sold, and that great confusion has been produced by the varieties of the so-called inches in which focal lengths have been expressed." At the International Ophthalmological Congress at Paris in 1867, Zehender proposed to adopt a new system of gradation by which lenses should be known by numbers, the No. 1 to represent a focal length of 240 centimetres, the No. 2 to represent a focal length of 120 centimetres, the No. 48, which is the third of the series, to represent 5 centimetres of focal length. The equivalents of this series, it may be seen, according to the other systems of gradation

now in use, would have to be found by an attempt at reducing the centimetre to some other kind of measure; but this is not all: the metre itself is, according to the commission which recommended and established it as a unit of measurement, approximately the ten-millionth part of the earth's quadrant; then the one-hundredth part of this unit must be an exceedingly indefinite quantity.

I spent the summer of 1878 in Paris. During my stay in that city I devoted considerable time to studying what is called "the metrical system" of weights and measures. I sought, at the dry-goods stores, sticks representing the metre, such as are used in measuring cloth. I bought three tape-lines from three different manufacturers, upon the surface of which were marked metres, centimetres and millimetres. I got three Verniers from different instrument-makers. By actual comparison, the marks on the three Verniers did not correspond. In taking a centimetre of space upon them, there was a total difference of from 1 to 1½ millimetres. The tape-lines varied much more than this, while the metre sticks differed more widely, both in total length and in the fractional marks upon their surface. Just think, then, what confusion must necessarily result from any attempt at determining the refracting powers of a lens by establishing its focal length, imperfect as are the means under the most favorable circumstances for testing.

Now, I am aware that difficulties beset all new ventures which partake of the nature of reform; yet I venture to suggest the propriety of casting aside all former methods of grading lenses, and of adopting an entirely new method which, to my mind, has the advantage of both simplicity and utility. I propose, instead of taking the quadrant of the sphere as a unit of refraction, as the astronomers did in the time of Roger Bacon, who was the real inventor of spectacle lenses, to begin with the lowest perceptible angle of refraction, and calculate by that means alone the refracting power of the whole series, from 5′ to 90°. For example, I would designate the lens which in the metrical system is called one-fourth dioptre, and which according to the astronomical refraction represents about the $\frac{1}{1440}$ part of the quadant, or a radius of 33′ 12″, by the angle of refraction of 30′. This, of course, would not be an exact equivalent, but a far more symmetrical proportion inside the maximum angle. I would begin, in fact, with a lens of just one-half that angle, and proceed something after this plan in the regular order of increase of the refracting power, namely: the weakest lens of the series might have a refracting angle of 15′, the next 30′, and the next 1°. Now, this lens of 1° of the angle of refraction would correspond almost exactly to $\frac{1}{360}$ part of the quadrant. Its radius would be about 1° 6′ 24″, at least that is the exact radius of the lens in the metrical system marked 0.50 D. Proceeding in this manner, the next lens in the series should represent 1° 20′ of refracting angle. This corresponds to ¾ D., or $\frac{1}{60}$ of the maximum angle of the old system, and represents 1° 39′ 36″ of radius. 1 D. of the metrical system corresponds to $\frac{1}{90}$ of the old unit, which has an angle of radius equal to 2° 15′. Instead of this, we should have an angle of refraction represented by 2° simply. Proceeding further by the separation of lenses according to the refracting angle of 30′ until an angle of 6° has been attained, the interval might then vary by 1° until 20° are attained; then 2° should separate the lenses of the series between 20° and 30°; then 3° from thirty to fifty, and 5° from fifty to ninety. A series of lenses projected upon such a plan would afford the greatest facility for testing the state of refraction in the eye, and would correspond scientifically to Snellen's plan for determining the acuity of vision upon the basis of a visual angle of 5′.

I present this matter for your serious consideration, in the hope that you will discuss it, if not publicly, at least amongst yourselves. I presented it in a brief manner to the Ophthalmological Section of the Ninth International Medical Congress. I have to-day considered the question from a slightly different standpoint. I shall attempt to give it more practical illustration at Newport next year if I have the good fortune to be able to meet with you.

SARCOMA OF THE SCALP.

Read in the Section on Surgery at the Thirty-ninth Annual Meeting of the American Medical Association, Cincinnati, Ohio, May 8–11, 1888.

BY P. S. CONNERS, M.D.,
OF CINCINNATI, OHIO.

Primary sarcoma of the scalp is of such infrequent occurrence that I trust I may be pardoned for reporting to the Section a case recently under my care.

In the latter part of October, 1885, I was consulted by Mrs. S., æt. 25, white, resident of eastern Kentucky, who stated that fifteen years before she discovered on the back of her head a small hard lump of the size of a bean, not painful on pressure. For thirteen years there was no noticeable change in the tumor, but at the end of that time it began to enlarge, and continued to do so steadily until the time of her confinement (five months before I saw her), when the mass was as large as a goose-egg. Since delivery its growth had been very rapid and attended with pain, at times severe. The woman was much emaciated and greatly enfeebled. The tumor occupying the occipital region and looking much like a second head, was somewhat movable from side to side, and upon palpation pseudo-fluctuation was detected. It measured antero-posteriorly 17 inches, laterally 15 inches. Its greatest circumference was 21 inches, and its

least circumference, at the line of junction with the head, was 15 inches. The tumor was removed on the 23d of October, two lateral narrow flaps and a posterior one being made, and the mass readily and quickly separated with the fingers from the pericranium, to which it was nowhere adherent. Hæmorrhage was quite profuse, though from no large vessels, was easily arrested by the application of hot water. The flaps when brought together covered-in the entire bared surface, small drainage tubes were brought out at the ends of the base of the now inverted T-shaped wound, iodoform dusted on and a thick layer of absorbent cotton applied. The mass removed weighed almost 5 lbs., and upon examination proved to be a spindle-celled sarcoma. The drainage tubes were removed on the fourth day, and the sutures (silk) on the eighth, when union was found to have taken place. The woman left for her home on the fourteenth day.

For eighteen months (until May, 1887) she continued well, but at the end of that time noticed a small tender spot and soon after a hard lump, which increased slowly for three months and then more rapidly. She was about a month advanced in pregnancy when the recurrence was observed. After her confinement (in the middle of January, of this year) excessively rapid growth took place, and when I saw her, on the 1st of March, the mass measured antero-posteriorly 18 inches, laterally 17½ inches, with a greatest circumference of 25 inches. Its surface was of a bluish color and several large veins ramified upon it. On the 3d of March I removed it, making no effort to save any covering, but cutting along the line of junction with the head. The pericranium was in places included in the diseased mass and was taken away. After the bleeding (less profuse than at the time of the first operation) had been checked, the edges of the wound and the denuded surface were cauterized with the Pacquelin button. The mass after removal weighed 7½ lbs. Dry borated dressings were applied. At the end of the second week erysipelas of the left side of the face, extending up onto the scalp developed itself but ran a mild course. Five weeks after the operation the patient left for her home, the granulating wound being in excellent condition.

The points of special interest in this case are the years—long absence of any change in the original nodule, the marked influence of pregnancy and lactation upon the growth of the tumor, both primarily and in recurrence, and lastly the immense size of the growth. The scalp is not seldom involved in sarcomata affecting the skull, but a primary tumor of such character located in it is exceedingly rare. As when situated elsewhere, in spite of removal and re-removal, the disease may be expected to recur and ultimately destroy life, but operative interference may result favorably, especially if timely. No hard, indolent lump in the scalp should be permitted to remain, even though for years in an unchanging and unchanged condition. Probably benign and to continue such, it may not be so now or in the future.

MEDICAL PROGRESS.

STERILIZED MILK.—By means of numerous experiments DR. CAILLE has reached the following conclusions: 1. The preparation and administration of sterilized milk can be managed in any well regulated household. 2. The boiling of milk for twenty or thirty minutes under slight pressure, in small bottles hermetically closed, is all that is necessary to practically carry our the principle involved in sterilization; *i. e.*, to destroy the germs of fermentation. 3. The essential material are small bottles with Soxhlet's stoppers, and a tray. 4. Milk boiled in small bottles for twenty minutes and immediately closed by rubber, cork or cotton stoppers will keep sweet, if put on ice for several days. 5. The boiling of milk in the ordinary way is faulty. All milk for infants' and children's use should be boiled in small bottles in a water bath for twenty minutes, when it will keep much longer than if boiled in the ordinary way and the usual length of time. 6. The transportation of milk during the summer months should take place in refrigerator cars. This should be secured by legal enactment. 7. An apparatus for properly boiling and preserving milk for infants' use should be at once introduced into every well regulated household. The essential utensils are: small bottles (5 or 6 oz.) with combination stoppers (Soxhlet's), and a tray of tin or galvanized iron—all procurable for a very moderate sum. A good brush for cleaning the bottles should accompany each set; also a tin dipper, with perforated inner bottom for warming the milk before giving it. Ten spare bottles with a few ordinary nipples would make the outfit complete. To facilitate handling and transportation such an outfit could be packed in a wooden box one foot square and high, and provided with a common handle. All the other utensils, as advised by Soxhlet, are superfluous; the more so as complicated apparatus is difficult to introduce for family use, and is soon discarded. Feeding tubes are difficult to keep clean, and should not be used. The ordinary nipples, for sale everywhere, will fit the bottles and can be turned inside out and thoroughly cleansed. It would be a good plan to stamp into the cover of the boiling pot: *Boil for 20 minutes*, this being important in view of the fact that printed labels are liable to be lost or mislaid.—*Dietetic Gazette*, April, 1888.—*Sacramento Medical Times*, August, 1888.

THE POSOLOGY OF QUININE.—MR. THOMAS

CHRISTY has received a letter from a Ceylon correspondent which throws a strong light upon the above subject. The writer had been trading in the island named, during the wet season, and caught an obstinate ague, which resisted the ordinary treatment with quinine. The patient then went to Newara Eilgie for the sake of change, and, being again attacked, called for the services of the assistant military surgeon of the station. This practitioner laughed at the account of the dosage of the alkaloid tried, and prescribed two half-spoonful doses of the sulphate in sherry, which effected a complete cure. Accounts of other cases are also given, including that of an English lady who suffered from ague and shivering constantly, even in the hottest weather of England. She was quite cured in a week by somewhat smaller doses than the above, and even faced a winter without any fear. Similar quantities of the medicine are recommended in low fever, and when taken in sherry or brandy on waking are stated to produce a delightful and lasting glow in the body, which smaller doses are powerless to effect. No unpleasant after-symptoms have been observed. The writer also calls attention to the circumstance that the same amount of quinine in pill or powder will not bring about the same happy result, and suggests that the differences in the therapeutic action referred to are worthy of more study.—*Gaillard's Medical Journal*, August, 1888.

CREOLIN AS AN INTERNAL MEDICINE.—DR. A. HILLER, Privat Docent in Breslau, publishes some remarks on this subject in the *Deutsche Med. Wochenschr.*, July 5, 1888. The antiseptic properties and comparative innocuousness of creolin, as used externally, have been made known by Fröhner and E. v. Esmarch, and their conclusions are also confirmed by Dr. Hiller. But creolin is of the greatest use in various diseases of the stomach and intestines. Its anti-zymotic influence comes out most clearly when employed against the numerous processes of fermentation and decomposition which accompany most, if not all, such diseases. "Its freedom from poisonous effects, and its perfectly non-irritant effects, make it an ideal antiseptic for the above group of diseases." Dr. Hiller asserts that creolin, given in strong gelatine capsules, in doses of between 3 and 15 grains three times a day, promptly and certainly relieves meteorism from whatever cause, whether constriction, typhlitis, catarrh, atony, or ileotyphus, and hopes thus to prevent perforation in the latter case. It was found equally efficient in simple flatulence, gastric dilatation, acute and chronic gastric catarrh, and diarrhœa. Given in a case of tænia and one of oxyuris, its action was prompt and efficient as an anti-parasitic. But creolin appears unfitted for children, owing to their inability to swallow capsules. Creolin may also be used to irrigate the rectum in carcinoma cases; used thus in solutions of 1 in 500 it acts like a charm in purulent cystitis (Jessner, *ibid.*, 1881).—*British Medical Journal*, July 21, 1888.

GALVANIZATION OF THE THYROID IN EPILEPSY.—In the *Rivista Sperimentale di Freniatria*, vol. xiii, Fasc. iii, DR. CELSO SIGHICELLI gives details of some cases of epilepsy which he treated by galvanizing the thyroid. He was induced to try this plan by reading Albertoni's description of convulsive attacks observed in dogs whose thyroid glands had been excised. These paroxysms were among the earliest symptoms of the characteristic cachexia following that operation, and bore a close resemblance to genuine epileptic fits. Dr. Sighicelli himself, moreover, had in two cases of mental disease noticed signs which appeared to him to indicate that changes in the thyroid had a direct influence on cerebral nutrition, and might thus cause psychical disturbance. He was, therefore, led to think that epilepsy might in certain cases be dependent on some abnormal condition of the thyroid. Having found electricity useful in hypertrophy of the gland, Dr. Sighicelli thought that it might possibly do some good in rectifying functional disorder. He accordingly applied a constant current of moderate intensity to each lobe of the thyroid alternately, at first for two or three, and afterwards for four or five, minutes at a time. The patients, seven in number, were all of the male sex, and in all of them the disease was of long standing. In three no visible effect whatever was produced; in the remaining four there was at the beginning of the treatment a sudden increase in the number of the attacks, but this was soon followed by a diminution in their frequency. Both the length and the severity of the paroxysms were greatly lessened, and when they did occur they were not accompanied by tonic spasms. There was almost entire disappearance of the phenomena which had previously preceded and followed each fit, and the patients were much improved in mind and disposition. In the two cases in which the success of the treatment was most marked, the amelioration began to show itself about a month after the first application.—*Brit. Med. Journal*, July 28, 1888.

POSTURE IN LABOR.—DR. FRANCISCO ALONSO RUBIO, in a paper read before the recent Spanish Gynecological Congress, laid great stress upon the important part that the posture of the patient plays during labor, both physiological and abnormal. During the first stage he merely keeps the patient from going from one room to another, to avoid catching cold. During the expulsive stage, though he prefers the supine, or at least a horizontal, position as a rule, he changes it to a sitting posture where there is asthma or cardiac weakness, also where the pains have become inert through uterine fatigue. Where there is any

version of the uterus, it is necessary to pay due regard to its direction. Thus, if there is anteversion, the patient should be placed on her back; if there is lateral version, she should lie on the side opposite that to which the fundus uteri is inclined, so as to bring the fœtal axis to coincide as nearly as possible with that of the pelvis. It is of course a recognized fact that a change of posture will frequently facilitate the descent of the head even when there is no abnormality either in the position of the child or of the direction of the direction of the uterine axis. When the fœtal position is transverse, the patient should be laid on the side opposite to that occupied by the head, with a pillow under the abdomen. The adoption of the genu-pectoral position has frequently been found of service by Dr. Rubio. When there is prolapse of the cord, and it is being dragged upon in a dangerous manner, he raises it above the head and keeps it there during several pains, the woman being placed in the genu-pectoral position. Again, in complicated presentations, he has found this the best posture for their reduction, and in arm and shoulder presentations, where the amniotic liquid has escaped, and the practitioner in attendance has been unable to insert his hand and turn, Dr. Rubio, by the adoption of this position, has found it possible to execute the necessary manœuvre.—*Lancet*, July 28, 1888.

MASSAGE IN INVETERATE ULCER OF THE LEG.—APPENRODT, of Clausthal, in a number of cases that had resisted all ordinary treatment, got successful results from the persistent use of massage. The leg should be carefully cleansed and disinfected before beginning, then light *effleurage* is made below the knee, reaching gradually downwards; only light pressure should be used; the appearance of lymph-exudation about the ulcer is the first sign of its good effects. The best material to employ in massage is lanolin (Jaffé and Darmstaedter), because, owing to its tenacity, it does not irritate, but protects, the skin. After massage, the skin is again well washed with soap and water, and disinfected; the ulcer, and any excoriations, are dressed with lanolin on lint; over this is placed a sheet of silk, and a cambric bandage is applied over all. The addition of disinfecting substances to the lanolin is not necessary, as they usually irritate the skin, and impermeable coverings must be altogether avoided. Under this simple treatment the swelling soon subsides, desquamation ceases on eczematous places, and granulations rapidly spring up on the ulcer itself. It is but rarely advisable to apply zinc oxide and starch to the former, or nitrate of silver to the latter. In spite of the abundant granulations, it takes a long time before the ulcer is healed, owing to the callosity and immobility of the skin, and in suitable cases Reverdin's transplantations may shorten the process. The massage must be continued for a good while after a cure has been effected, in order to restore as far as possible the natural condition, and prevent relapses. The patient should make free use of the limb during the treatment, for it will be found that the pain and tendency to œdema soon cease.

HYPODERMATIC USE OF THE ALKALOIDS.—The Paris correspondent of the *N. Y. Medical Journal* writes: The rapidity of the absorption of alkaloids by the subcutaneous tissue is not at all well known, and M. CHOUPPE has been making some interesting studies in regard to this matter. It is of the utmost importance that we should know the exact dose of drugs that we use by hypodermic methods. From the experiments made it is certain that, when the usual doses of the different alkaloids, dissolved in equal amounts of liquid, are injected, they act with quite a difference as to the time it takes to produce an effect on the general circulation. Morphine, for instance takes as much as from six or seven minutes to produce its sedative action, while apomorphine acts in four minutes. Some of these facts are well known, but it is very important that we should know more exactly than we do the precise time it takes to produce the therapeutic effect of all the alkaloids given hypodermically; so that we may not fall into the rather common error of giving fresh doses before the one first given has had time to act.

ANTISEPTIC OINTMENTS FOR VAGINAL TOUCH OR FOR DRESSING EXCORIATIONS, FISSURES, ETC.—DEMELIN recommends the following formulæ:

℞—Vaseline	30 parts.
Boric acid finely pulverized	4 "
℞—Vaseline	120 parts.
Biniodide of mercury	1 part.
℞—Vaseline	30 parts.
Finely powdered iodoform or iodol or salol	4 "
℞—Vaseline	30 parts.
Creasote	1 part.
℞—Olive oil	100 parts.
Crystallized carbolic acid	10 "

The carbolized oil may be advantageouly used in lymphangitis of the breast.—*Revue Générale Clinique et de Thérapeutique*, June 28, 1888.

TREATMENT OF TYPHOID FEVER BY COLD BATHS.—LIEBERMEISTER, of Tübingen, lays down the following propositions: (1) In the majority of fevers the increase of temperature constitutes the danger of the patient; (2) it is the duty of the medical attendant to combat the elevation of the temperature by suitable means; (3) the basis of antipyretic treatment consists in the direct abstraction of caloric by cold baths; (4) there are cases in which antipyretics may be used.

THE

Journal of the American Medical Association.

PUBLISHED WEEKLY.

SUBSCRIPTION PRICE, INCLUDING POSTAGE.

PER ANNUM, IN ADVANCE.....$5.00
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No. 65 RANDOPH STREET,
CHICAGO, ILLINOIS.

All members of the Association should send their Annual *Dues* to the *Treasurer*, Richard J. Dunglison, M.D., Lock Box 1274, Philadelphia, Pa.

LONDON OFFICE, 57 AND 59 LUDGATE HILL.

SATURDAY, AUGUST 18, 1888.

THE LANGUAGE OF MEDICINE.

"In medicine," says an author of a recent work,[1] "we may often obtain more practical benefit from the study of some word with an account of the errors involved therein, than from the study of a new theory which rises like a balloon only to burst like a bubble." Dr. Campbell has written what may be called a synopsis of the linguistic history of medicine, which will prove especially valuable to those that have "small Latine and lesse Greek." The claim is made that in studying mathematics or grammar the pupil begins with definitions of the new words to be employed, and that the student of medicine also could save much valuable time by first mastering the meaning of the technical terms by which the principles of the science are to be carried into his mind.

But if it be meant that the student of grammar or medicine must get into his head as soon as possible the meanings of the technical words and terms with which he must come in contact in his study of a language or of medicine, and without applying them as he goes along, we are inclined to think that the student is not wisely advised. The study of definitions of words of a language that he is constantly using is a very different matter from studying definitions of a language that is only beginning to be learned, and it would be a most unprofitable expenditure of time for a student, before he enters fully upon the study of medicine, to lumber up his memory with the significations of words that are to be applied afterwards. In learning to read a dead or a foreign language the pupil acquires his vocabulary gradually, and as he needs it. He studies to better advantage if he look in the dictionary for each unfamiliar word as it occurs, than if he commit to memory a list of such words before each lesson. At best the commission to memory of a list of words with their meanings is a piece of drudgery, which is scarcely lessened by the knowledge that there will be use for these words in the future. That words must be understood before the thoughts that they convey can be comprehended goes without saying. In the process of learning definitions, however, the student is not walking, but crawling; he must not be expected to assume the erect position and walk before he has mastered the principles of crawling. Assuming that the baby that can only crawl could read, would it hasten his walking to read a work on the mechanics of walking? In laying the foundation of a building the workman does not use his blocks of stone till he is ready for them.

That the history of the language of medicine is valuable for instruction no one can doubt. It has been said that the more languages one knows the more easily are other languages learned; a saying based upon the fact that different languages have much in common. As regards its technical words, medicine, like other sciences, is cosmopolitan. When a new word is coined to express an idea that has not had expression before we do not stop to translate it; we use the original coinage. The translation into English of a new coinage of another language is very like our translations of the metric quantities: it makes so much, with something over. It is better, therefore, to use the word as we find it. And just here the English language has, or seems to have, an advantage over other languages. French, Italian, Spanish, and other writers, the German to a less extent, seem to think it necessary to alter the architecture of all new words that fall into their hands.

Every one must have noticed the difference in the pronunciation of medical words by medical men. This is even true of words derived from the Latin, or of Latin words still unchanged. Medical men are not always supposed to be familiar with modern languages, and the mispro-

[1] The Language of Medicine. A Manual giving the Origin, Etymology, Pronunciation, and Meaning of the technical terms found in Medical Literature. By F. R. Campbell, A.M., M.D.

nunciation of these is to a certain extent excusable. We believe there is a sentiment, or an idea, that every medical man must know something of Latin. Dr. Campbell says that the English method of pronouncing Latin should be learned by every student contemplating the study of medicine. "Medical technical terms should be regarded as English words borrowed, for convenience sake, from the classical languages." He claims that the use of the "so-called Continental method" would sound pedantic, affected, and ridiculous; "such familiar words as *vapor, cicatrix* and *vagina* would scarcely be recognized if pronounced *wahpor, keekahtreex* and *wahgheenah*." We think not. Even a teacher of the Continental method would be at loss to know what was meant by such unheard of sounds. There are two things to be said in favor of the Continental method of pronouncing Latin: The Germans, the greatest students of the dead languages use this method, and they do not, as Dr. Campbell implies, pronounce Latin according to the sounds of the letters of the German language. In the second place, one might safely offer a handsome prize to anyone that will scan correctly five lines of Latin poetry by any other method of pronunciation than the Continental. The majority of medical terms that are pure Latin words, however, may be regarded as English words in so far as the pronunciation is concerned.

BLOOD STAINS.

Blood stains often play an important part in medico-legal cases. Much of the existing literature upon this subject has outlived its usefulness, and the medico-legal expert or the lawyer that bases his conclusions on such is liable to err. An important contribution to this subject has recently appeared—"Comparative Studies of Mammalian Blood; with special reference to the Microscopical Diagnosis of Blood Stains in Criminal Cases," by DR. HENRY F. FORMAD, of Philadelphia.

Is it human blood? is a question that sometimes involves serious consequences. In determining this question in regard to blood stains, it should be remembered that blood stains are best seen by artificial light. The liquids used for re-moistening and disintegrating dried clots of blood must be of such composition that no harm will be done to the corpuscles. If one wish simply to determine the presence of blood corpuscles, then water, oil, alcohol, glycerine, etc., may be used. But to preserve or restore the shape of the corpuscle some other liquid must be used, such as Moleschott's, Müller's, Radnew's, etc. Dr. Formad finds that in his hands Müller's fluid (composed of 2 parts of potass. bichromate, 1 part of sodium sulphate, and 100 parts of water) and very strong solutions of caustic potash give the best results. To obtain the largest quantity of unaltered measurable corpuscles from old dried clots and blood stains, it is advantageous to apply moisture and slight heat for several days. His procedure is as follows:

A small granule of the suspected blood or a fibre from the blood-stained fabric is placed on a glass slide in a drop of a 30 to 35 per cent. solution of caustic potash and covered with a cover glass. If the blood-stain was recent, the disintegration of the clot commences at once, and the isolated corpuscles separate and swim swiftly through the liquid if the stage of the microscope is slightly inclined. It is quite interesting to observe how perfectly well-shaped blood discs will tear themselves away from the original formless brown mass. In direct proportion to the age of the stain, from one to within ten days, the softening of the microscopic blood mass and the isolation of the corpuscles is protracted. In dried blood older than ten days the ratio of softening or disintegration cannot be well observed, and a stain of two years old behaved like one of ten days.

The examination can be made under comparatively low amplification, such as 300 to 500 diameters; but when measurements are necessary, then an immersion lens, giving a magnifying power of about 1,000 diameters, better be substituted. Sometimes but a few well-shaped measurable corpuscles are seen, but quite often, in successful preparations from recent blood stains, nine-tenths of the corpuscles in a certain microscopical field will appear quite perfect and fit for measurement.

If the blood specimen is slow in disintegrating and the corpuscles imperfect in appearance, then he adopts the following procedure: The glass cover beneath which the blood fragment is macerating on the reagent is ringed with a little oil, or, still better, with some cement, in order to fasten it and to prevent evaporation, and placed in a moist chamber (a glass vessel, lined with moist paper, and covered). The chamber itself is put

in a water-oven (incubator such as used in bacteria investigation) and subjected to uniform slight heating, not exceeding 100° F., and kept there from one to three days, or as long as is necessary to obtain the desired result, the specimen being examined from time to time. Care must be taken not to overheat the preparation, and to guard against evaporation of contents, *i. e.*, of the liquid between the glass slide and glass cover in which the blood specimen macerates. A number of experiments may be made simultaneously, some of the blood specimens being treated with a strong solution of caustic potash, others by Müller's fluid, the latter often succeeding in very old blood clots to restore shrivelled and to isolate perfect corpuscles when the former fails. While the Müller's fluid with glycerine must be diluted with water in order to obtain the desired specific gravity, a peculiarity in the action of the caustic potash solution must be borne in mind, viz.: that the stronger the solution the better its effect, whereas weak solutions of this reagent (caustic potash) destroy the blood corpuscles or reduce them in size by making them spherical. A strong solution (30 to 35 per cent.) gives most beautiful results. The red blood corpuscles have an absolutely natural appearance; retain their perfect color and shape or sometimes resume it, if previously lost, form rouleaux, show the normal biconcavity of the discs, and even show normal diameters on measurement; in short, behave like normal blood. Such is the case where the blood stain was a recent one, and, in fact, the rapid appearance of such good and perfect pictures under the microscope are indications of the recency of the blood stain.

Obviously, however, we cannot draw conclusions and make a diagnosis unless we take into consideration the shape of the corpuscles, the abnormally small and disfigured ones being excluded. "*At least 500 measurements should be* made in establishing the average diameter." Probably no one that has read the works of the late Dr. J. G. Richardson will question the immense importance of micrometric measurements in all medico-legal cases involving blood stains. Lacour and Masson assert that "one can certify that corpuscles found in the blood under examination are in all points identical with those of man or of the guinea-pig, if they measure more than 1–127 mm." Malinan, of Tiflis, a prominent expert, testified in court as follows: "If we find corpuscles in blood stains, the diameter of which is 0.0077 mm. or more, then we can conclude that it is in all probability human blood." The consensus of opinion is that the *expert* has the right to express himself quite definitely as regards the probable identity of blood.

The paper of Dr. Formad is a very interesting one, and may be found in the *Journal of Comparative Medicine and Surgery*, July, 1888. It will be of special interest to medico-jurists and to microscopists.

In the *N. Y. Medical Journal* of August 11 Dr. Simon H. Gage calls attention to the fact that the red blood corpuscles of lamprey eels are very much like those of man in general appearance. They may be distinguished from those of the human, 1, by the presence of a nucleus, which is made apparent by drying, by acetic acid, and by usual reagents; 2, except in the embryo 9 to 10 mm. long, which would never be used for bait, the corpuscles are nearly twice as large as those of man.

PURE HEAT FROM COAL.

In the past two or three months an article on "The Direct Production of Pure Heat from Coal," taken from an English journal, has been extensively noticed and copied in the newspapers of this country. While there may be some valuable features in the system described, some of the statements are sufficiently extraordinary to deserve comment, if not severe criticism or unbelief. It seems that a Mr. W. A. Gibbs was called upon by some India tea planters to devise a method by which pure hot air, suitable for drying tea, could be obtained from waste wood or coal. The apparatus made by him, and which, it is claimed, fulfils all the requirements, consists of a brick chamber 5 x 2 x 2, built upon the ground, with a feed and a fuel chamber at one end and a powerful fan at the other. Between the chamber and the fan are baffle plates, splitting plates, a standing bridge with perforations at the back, and a hanging bridge with perforations at the front. There are also a number of carefully proportioned inlets to the pipes, for supplying the exact quantity of air required to cause perfect combustion.

It is stated that when the fire was started and

in "good running order," there issued from the fan-mouth a column of hot air 12 inches in diameter, with a uniform temperature of 500° F. "No trace of smoke or discoloration was visible to the eye, nor any odor or taste perceptible." The reporter states that he held his face in this blast of hot air, at 500° F., and that, except for the very high temperature, he felt no inconvenience. It is not stated how long he held his face in the blast. That he could *hold* it there at all.

The most extraordinary thing, however, is the statement that the air drawn directly from the fire was *perfectly pure*. One can readily understand how the air could be kept free from smoke; but how was the carbonic acid removed? The coal being burned in the furnace, the combustion products must have been either carbonic acid or carbonic oxide, or both; and no increased supply of oxygen or nitrogen could have destroyed the carbon that would be present in some form or other in the escaping air.

A *pure* heat, or hot air, direct from coal might be advantageous in many ways, but one cannot accept the statements outlined above until the method is more clearly explained.

CHEMICAL PURIFICATION OF SEWAGE.

DR. A. PFEIFFER has recently contributed an interesting paper relating to the insufficiency of chemical processes for purification of sewage, to a German sanitary paper. In a general way he reviews the different methods that have been adopted for the chemical purification of sewage, and points out the dangers of the irrigation method of sewage disposal. It is now understood that the great danger from sewage water lies in the microörganisms that infest it, and Pfeiffer asks if the modern methods of purification as applied to the waste of towns and cities, have any real effect in clearing the sewage of these microörganisms.

We know, of course, that carbolic acid, bichloride of mercury, and other chemicals kill germs, but we know also that we cannot apply them on any very extensive scale. We cannot make the sewage strongly alkaline nor acid in order to destroy the microörganisms, because the fish in the streams would be destroyed, and the waters rendered useless and injurious. In Pfeiffer's opinion the other chemical methods that precipitate the solid portions of the sewage are of very little avail, since they do not destroy the bacteria, nor remove the dissolved organic matters upon which they feed. He claims that sewage thus treated will in a short time regain all its offensive properties, and that the clarification is but a temporary expedient. He thinks it would be better in the case of rivers of large volume to discharge the raw sewage into the river than to erect extensive chemical works for its chemical treatment.

A STOIC OF SEVEN YEARS.

A remarkable case of concealment of severe injury occurred in Evansville, Ohio, on August 8th, according to the newspapers. It seems that the 7-year old son of Austin Coombs, took a revolver from his father's desk, and while playing with it accidentally discharged it, the ball taking effect in his abdomen. On his mother's return she questioned the boy, who admitted having discharged the revolver, saying nothing of the injury to himself. He having been forbidden to touch the revolver he was chastised by his mother, the boy standing the punishment without a whimper. Shortly afterward he slipped away to a room upstairs and prepared to change his clothes, the ones he wore being clotted with blood from the pistol wound. Toward noon he began to feel sick, and going into a side room lay down upon the floor. Upon being called shortly afterward to get some wood he replied that he could not and that he was sick. His mother going to him noticed for the first time that his clothes were covered with blood. After an examination she surmised the truth, and upon close questioning the boy admitted that he had shot himself. This was not until some three hours after the accident though, and the boy at last reports was steadily sinking.

It is not stated whether any effort was made to perform laparotomy. It seems remarkable that the injury, if seriously involving internal organs, did not cause more immediate and profound shock. That it did not is in favor of the opinion that an operation might have saved the child. At any rate, given a bullet wound of the abdomen, if the hydrogen gas test cannot be applied, the indications are to perform laparotomy.

DR. BRAMANN has been recognized as Privatdocent in surgery in Berlin.

EDITORIAL NOTES.

PELVIC CELLULITIS IN THE MALE.—In a recent number of the *Tidsskrift for Praktisk Medicin* DR. SKJELDRUP describes a case of pelvic cellulitis in a man 50 years old. The first symptoms in this case were vomiting, flatulence, constipation, abdominal tenderness, and tympanites. There was some pain over the cæcum, and resistance on palpation and dulness on percussion at the same point. Examination *per rectum* showed a tolerably hard tumor situated in the left hypogastrium; it was easily felt by bimanual palpation. An aperient was given, with quinine and iodide of potassium, and wet compresses over the abdomen, for some days. The patient did not improve, the abdominal pain and distension became greater, the difficulty of passing flatus and fæces increased, and the patient was becoming more and more emaciated. An œsophageal tube was passed up to the sigmoid flexure, and a warm enema given, producing a scanty evacuation. The tube was bent by the tumor, which displaced the gut backwards. The enema was repeated two days later, resulting in the copious evacuation of foul-smelling fæces. The patient then began to improve, and after a few more injections fæces were passed naturally. At the end of a month there seemed to be but a slight infiltration anterior to the rectum. The tumor, while it existed, was of an irregular shape, and sometimes appeared to be firm, elastic and tender. In 1885 Dr. Muir, of Selkirk, published a case of pelvic cellulitis in the male.

CAUSE OF MILK SICKNESS.—The following, in an afternoon paper, comes from Vincennes, Ind.: W. T. Ratcliff, of Olney, Ill., has made a wonderful discovery of the plant that causes milk sickness. Some time ago Mr. Ratcliff, who lives eight miles south of Olney, was climbing over a fence and broke a weed, which came in contact with his hand. Mr. Ratcliff had at one time been afflicted with milk sickness. He noticed the broken weed had a peculiar smell, reminding him of his illness. It so impressed him that he resolved to test it. He took from his herd of cattle a young calf and fed the weed to it. The animal soon came down with the milk sickness and died. Mr. Ratcliff was not satisfied, and he fed the weed to two other healthy cattle from his stock, but the result was identically the same. He took the weed to Olney and placed the matter before a doctor friend, who is now in conference with the Illinois State Board of Health. The discovery has created a good deal of interest, and a thorough test will be made by the State authorities.

SUDDEN DEATH AND ENLARGED THYMUS.—In a recent number of the *Deutsche Medicinische Wochenschrift* P. GRAWITZ, of Greifswald, records two cases of sudden death in infancy, one child being 8 and the other 6 months old. At the autopsies were found the usual signs of death by suffocation, with a very large thymus gland in each case. The question as to whether fatal dyspnœa might not be produced by pressure in such cases is one of considerable medico-legal importance. Virchow has a preparation of an enlarged thymus from a child that died of asthma, and he says: "The thymus was so enlarged that I do not see how anyone can deny that the dyspnœa may have arisen from its pressure."

QUACK DOCTORS' PAMPHLETS.—At the Liverpool City Police Court, on July 23, a man was sent to prison for fourteen days, with hard labor, for distributing in the streets objectionable pamphlets of a firm of quack doctors. Another man was fined 20 shillings and costs, or fourteen days, for posting bills of like character in urinals. Last week a Chicago Police Justice discharged a person arrested for the first offense, the prisoner claiming that he was ignorant of the law.

SCIENTIFIC CONGRESSES IN 1889.—In connection with the Exposition in Paris in 1889 there will be held International Congresses of Hydrology and Climatology, of Hygiene, of Dermatology and Syphilography, of Electricians, of Physiology, and of Therapeutics. The Committees on Organizations have been appointed, and it is probable that the names of the officers will be soon announced.

A NATURAL CUBIC CENTIMETRE MEASURE.—Says an exchange: "Every one has at his disposal a cavity, viz., the external auditory meatus, whose capacity is about a cubic centimetre." It is likely, however, that the use of this cavity for measuring drugs will not become popular.

THE INTERNATIONAL HYGIENIC SOCIETY has opened two kiosks for ladies in London. These will afford writing and reading rooms, and two

large swimming baths, surrounded by recreation grounds. It is proposed to establish fifty similar places in London for ladies (women?), about one hundred in the City for men, and swimming and shower baths in East London.

FRACTURE OF THE SCAPULA WITH LUXATION OF THE HUMERUS is very rare. Dr. Valnot, of Pargues, Aube, records a case, in the *Revue Générale de Clinique et de Thérapeutique*, of July 26, caused by a carriage wheel passing over the scapula.

PRINCE LOUIS FERDINAND, of Bavaria, has passed the State examination of the Empire, conferring upon him the right to practice medicine. He is the second member of his family to enter the profession.

THE RAILWAY COMPANIES OF ENGLAND have taken steps to have their employés examined for color blindness. Arrangements have also been made for examining persons of the mercantile marine.

A NEW JOURNAL, entitled "*La Médecine hypodermique, antisepsie médicale au moyen des injections sus-cutanées*," has appeared in Paris. It is edited by Dr. J. Roussel.

THE DISTOMUM HÆMATOBIUM, according to the *Deutsche Medicinische Wochenschrift*, has caused an epidemic disease among the Italian troops in Massaua.

THE ROYAL COMMISSION ON HIGHER MEDICAL EDUCATION, which has been sitting in England, will, it is thought, issue its report early in October.

THE MICROBE OF EPIDEMIC DYSENTERY, it seems, from a report made by Cornil, has been discovered by his pupils MM. Chantemesse and Vidal.

THE CONGRESS ON TUBERCULOSIS.—At this Congress, which met in Paris in the latter part of July, there were 400 members, about 70 being foreigners.

ISOLATED PAVILIONS FOR INFECTIOUS DISEASES are to be built in connection with the Hospital for Children's Diseases in Paris.

DR. LUDWIG JULIUS BUDGE, Professor of Anatomy and Physiology in the University of Greifswald, has recently died, aged 76.

PROFESSOR HUGO RUHLE, the well-known clinician of Bonn, died on July 11, aged 59.

PROFESSOR FRITSCH has declined to leave Breslau for Würtzburg.

SOCIETY PROCEEDINGS.

Philadelphia County Medical Society.

Stated Meeting, June, 13, 1888.

C. B. NANCREDE, M.D., IN THE CHAIR.

DR. JOHN S. MILLER read the following paper:

A CONTRIBUTION TO THE STUDY OF BONE REPAIR.

The recent observations of Macewen[1] have done much to stimulate the study of bone repair, and have not thrown a little light upon the function of the medullary cells in osteogenesis.

The resort to mechanical irritation of the medullary tissues as a means of accelerating bone repair, is an old procedure. Nancrede[2] claims a priority in this for America. As far back as 1793, Eve[3] relates that the lay surgeons of the frontier were wont to make multiple perforation of the external table of the skull where necrosis had followed the Indian mutilation of scalping. And twenty years ago Agnew[3] resorted to the same procedure in a case of injury to the head. A fatal termination of the case, however, by encephalic complication, rendered the experiment incomplete. Reports of success by this procedure have been recently multiplied to an extent which will excuse us from repeating them in detail.

That furthermore, medullary proliferation is not only an element in osteogenesis, but is of itself sufficient to that end without periosteal coöperation, is evidenced by the case of Macewen[4], in which a considerable restoration of the humerus was secured "by bone transplantation," after a suppurative inflammation had destroyed both the shaft and its periosteum. The date of this observation is 1878.

The patient was a boy, two years or age. A suppurative periostitis of the right humerus of nine weeks' duration had resulted in total necrosis of the entire diaphysis, and this latter had been removed, leaving a tube of granulation material lining the periosteum. This tube had been kept patent by suitable dressing, until the whole space had become filled with granulation tissue, and had finally become a mass of cicatricial tissue. No bone had grown from this periosteum, except in a small part next the proximal epiphyses,

[1] Annals of Surgery, vol. vi, p. 289 et seq., 389 et seq.
[2] Internat. Encyl. of Surg., by Ashurst, vol. v, p. 8.
[3] Remarkable Cases of Surgery, p. 35. Philadelphia, 1857.
[4] Loc. cit., p. 301.

where at the outset the periosteum had been found covered with plaques of adherent osseous tissue. In the remainder there had been no osseous deposit, the result being a flail-like arm, which the patient found so useless that the parents desired its removal.

Macewen determined, however, upon another procedure. An incision was made into the upper third of the arm, exposing the head of the bone, to which was found attached a spike-like process of cartilage. This was removed, leaving as remains of the diaphysis a portion of bone 1¾ inch in length. From this point a sulcus about 2 inches in length was made in a downward direction between the muscles. The former presence of bone was nowhere indicated, and there was no vestige of periosteum, and the sole guide as to the correct position into which the transplant was placed was an anatomical one. Two wedges of bone were then removed from the tibia of a patient aged 6 years, with anterior curves. The face of the osseous wedges consisted of the anterior portion of the tibia, along with its periosteum, the wedges gradually tapering toward the posterior portion of the tibiæ.

After removal they were cut into minute fragments with the chisel, quite irrespective of the periosteum. The bulk of the fragments had no periosteum adhering to them, they having been taken from the interior of the bone.

They were then deposited into the muscular sulcus of the boy's arm, and the tissues drawn over them, and carefully adjusted. The wound healed without pus production. Two months after a portion of bone an inch in length and ¾-inch in thickness was found firmly attached to the upper fragment of the humerus.

Two other wedges of bone, larger in size, were similarly dealt with, and inserted two months subsequently to the first graft, and a third couple were placed in position five months after the first. These filled up the gap in the arm to the extent of 4¼ inches. The arm then measured 6 inches in length.

Soon the utility of the arm was greatly restored. Seven years afterward he was seen and examined. The shaft of the humerus was found to have increased in length by 1¾ inches, being now 7¾, and it had increased in circumference to a marked extent, and assumed a somewhat irregular shape. The length of the sound arm had, however, considerably outstripped the length of the transplanted humerus. He could use the arm for many purposes, taking his food, adjusting his clothes, and many games.

Whether the introduction of proliferating medullary cells into ordinary connective tissue granulations may convert the whole into osseous tissue, or that a few osteoblasts will, so to speak, leaven the whole mass, is a question involving grave doubt, but the affirmative would seem to receive some support from the case which Nancrede[5] relates in 1883. An extensive laceration had caused denudation and necrosis of the ulna in two-thirds of its extent. The process of repair had been delayed. He drilled numerous holes through the sequestrum into the medullary canal and, to quote his own words, "in a few days granulations sprang up from the ulna and fused with the granulations of the soft parts, and in course of time the fragment was separated."

That the procedure in this case had the effect of stimulating osteogenesis from within we can readily believe; but concerning the fusion with granulation tissue without, a more accurate observation than is recorded by Nancrede is desired. Although by analogy we might conceive it possible, inasmuch as repair within the bone is by ossification of an embryonic tissue derived from the connective tissue around the blood-vessels of the medullary spaces. A similar case is reported by Macewen,[6] in which granulations appeared upon a surface of bone completely denuded of its periosteum, and gradually spread until they became united with the granulation tissue at the periphery of the wound. Macewen, however, infers from this observation that "the periosteum covering a bone may be completely destroyed or permanently removed, yet the denuded bone may not only retain its vitality, but may throw out cells which will cover it and form a new periosteum."

These cases would seem to confirm Macewen's dictum that the periosteum has no part whatever in the regeneration of bone. But the first case I shall present to your notice this evening demands a different hypothesis for its explanation.

The patient, D. M., aged 14 years, suffered from an osteomyelitis of the right tibia, resulting in total necrosis of its diaphysis. A complete involucrum had formed around the sequestrum and afforded an unsteady support to the body weight. It was covered with the thickened periosteum. A number of fragments had been removed from time to time, and the parents had refused to entertain for him the proposal of amputation. The case, however, when it came into my hands, had become from septic infection so desperate that I was compelled to do something radical at once.

Exposing the shaft, or rather the involucrum, through its whole length, I made with trephine and saw a fenestrum large enough to permit the removal of the remaining sequestra, and cleared out the whole canal. Both epiphyses were found carious upon their exposed surfaces, and were scraped to the limit of safety. In a few days a superficial necrosis took place upon the inner surface of the tube. Demarcation was, however, promptly effected by the free use of aluminum acetate[7]

[5] Transactions of the Philadelphia Academy of Surgery, 1888.
[6] Loc. cit., p. 293.

[7] ℞. Pot. et alum. sulph., 1 part; plumb. subacet., 5 parts; aquæ bull., 100 parts. M. Filtra.

—that sheet-anchor in all sloughing wounds—and a fine layer of fine granulations became the field for any osteogenesis which we might hope to witness. During the long process of repair with the carious epiphysis as a never-failing source of bacterial supply, it was no trifling task to keep this extensive opening dry and sterilized. Furthermore, neither the patient, the household nor the neighborhood could endure frequent dressings without great nervous prostration.

The requirements of the case were successfully met by a mixture of iodoform and starch, in proportions which varied with the changing conditions. The cavity of the wound was filled with this dry powder, and to the whole was applied a closed dressing of gutta percha tissue. The purpose of the starch was to absorb the excess of moisture incident to a closed dressing, as well as to dilute the iodoform. As soon as the powder became saturated, it was removed by a stream of sterilized water, and the wound was filled and closed as before. The periods of dressing were gradually increased from three to ten days. I mention these details because, without them, or similar ones, we can wait in vain for the desired repair. In process of time the hollow of the involucrum became completely filled with granulation tissue, which continued to extend until it fused with the granulations from the soft parts and, finally, the whole became covered with a new epithelium, which had gradually spread from the edges of the wound. The tissues now became denser, and offered more and more support to the body weight until, as you see, he has acquired a very useful limb, and can walk without discomfort.

We must, therefore, infer that a metamorphosis into bone has taken place, and as the original diaphysis was gone with its medullary structure, we can find no osteogenic agent in the result other than the periosteum.

We must draw a similar conclusion from the recent case reported by Ceci:

The patient, a young man, developed an acute osteomyelitis of the left scapula five days after circumcision for inflamed phimosis. One month later Ceci[8] extirpated the bone, making the usual L-flap. The periosteum was left intact as far as possible, and the arm was preserved. The patient recovered rapidly, and there was a subsequent regeneration of the bone.

The only possible explanation of this result is by the hypothesis of periosteal agency or coöperation.

The second case which I present is in confirmation of Macewen's proposition that

"A portion of bone which has its continuity severed on all sides, and has had all its periosteum removed, is capable of living and growing."

[8] Centralbl. f. Chirurgie, Dec. 17, 1887.

This is in contradiction to our inference in the case of the tibia, and can be reconciled only by the assumption that the discovered laws of osteogenesis are of a lower order, subject to some general law of which we are as yet ignorant. But to the case.

Mrs. L., aged forty-seven years, had suffered with a neuralgia of the maxillaris inferior, for the relief of which all medical means had been exhausted in vain, and which, therefore, left to my option only the dernier ressort of neurectomy. The mode of operating was the usual one. The ramus was trephined near the angle of the jaw, the canal was exposed, and about two inches of the nerve trunk were drawn out and exsected. The button was, however, returned after having been sterilized in a 1 to 1000 solution of corrosive sublimate, but it was not returned to its old position. With a view of imposing a barrier to the reproduction of the nerve, it was so rotated around its vertical axis that the groove upon its lower surface stood at right angles to the axis of the canal. Not only did the wound close by first intention, but the button grew solidly in its position. Now, the curious thing in the case is, that before trephining I had carefully removed the periosteum, so that the latter can claim no part in the subsequent bone repair. After seven months there has been no return of the disease.

DR. JOHN B. ROBERTS: It is a curious fact that the medical mind has not appreciated the possibility of bone production, despite the frequent instances that must always have come under notice. I was taught in cases of comminuted fracture to take out the spicules of bone that were entirely separated from the larger fragments, lest they should necrose and give rise to trouble. Now it is the practice of the best surgeons to leave the spicules, and we find that often they do not die, and that they assist in the process of union and solidification. This experience is in the same line as the facts given by Dr. Miller in connection with his interesting cases. If these spicules of bone can reunite, why not the button removed by trephining? Why is it not good practice to insert, when necessary, a portion of dog bone or chicken bone? as, indeed, has been done. We must not forget, however, the importance of asepsis, and that it is antiseptic surgery that has made these procedures possible.

In a case such as Dr. Miller reports to-night, where he rotated the button of bone, turning the groove in which the inferior dental nerve had run at right angles to its former direction, I should be inclined to go still further, and turn it upside down. The bottom of the pit in which it is to be placed, and the periosteal surface of the button being scraped, the ungrooved, freshened surface, formerly external, would then be placed inward, and a bony plug would be interposed between the divided ends of the nerve, probably preventing

the reunion and return of pain which so often occur.

The case of tibial resection has been very interesting to me, as I have recently operated upon a similar one; the patient being, however, a woman of about fifty years, so that I cannot hope for as complete a closure of the cavity in the bone as in this growing child, exhibited by Dr. Miller. In that case I removed the whole front of the tibia, going as near the articular cartilages above and below as I dared. The process of repair is like that we see in a tree. We know that if a foreign body is inserted into a wound made in the trunk of a young tree, the process of cell growth will go on about it, and finally it will be completely covered in, and its presence be unsuspected, until, perhaps, the saw strikes it, as the tree is being converted into lumber.

Dr. Keen, in his recent case of trephining for brain tumor, returned the button of the skull removed, and the patient was able in a few days to walk around with a perfectly healed and reunited cranium. Then we know what the dentists do in the way of transplantation of teeth, or return of teeth to their original sockets after removal of diseased portions. More remarkable still is the implanting of old, dried teeth into new sockets, bored in jaws from which even the alveolar process had disappeared, and their becoming fixed there.

DR. GEORGE E. STUBBS: In reflecting upon these cases, and similar ones, it occurs to me that perhaps in the numerous resections we have done in army and in civil practice, we have made mistakes. Surgery has advanced immensely since the war time, and antiseptic surgery has opened new possibilities. Often in my army practice we removed all the bone when there had been a comminution. I should now, with our new light, try to save more of the broken bone, and so shorten the period of recovery.

In regard to operative treatment of neuralgia, I believe that we are entering upon a stage of work that will be much enlarged in the near future. I had a case recently in which neuralgia of the inferior dental nerve had existed for nearly seven years. I removed one and three-fourths inches of bone with the dental engine, took out as much of the nerve as I had access to, and dressed and treated the wound antiseptically. The wound healed by first intention, and as yet there has been no return of pain; so that I consider I have obtained a very good result.

THE CHAIRMAN, DR. NANCREDE: The first question to be answered in a discussion of this kind is, What constitutes the periosteum? If we mean a fibrous membrane, the inner layer of which consists principally of yellow elastic tissue, then we must agree with Macewen's extreme views, and admit that it has nothing to do with bone repair. But if we study the normal process of bone development, I, at least, must arrive at a different conclusion. The long bones are laid down in cartilage, a temporary structure. How do they ossify? By means of this very periosteum, which Macewen treats with such contempt, and which Ollier exalted too highly. There is a third layer of the periosteum in direct contact with the bone, and this layer is composed entirely of those elements which, wherever we see them, we recognize as the agents of ossifications—the osteoblasts. The temporary cartilage is invaded by connective tissue, ingrowths from the periosteum, covered with osteoblasts, and is eaten up by them; and we find it permeated, and finally replaced by a network of fibrous tissue covered with osteoblasts. A certain number always remain beneath the periosteum. A certain number, very small, remain in the Haversian canals, a still larger number in the medulla.

It is clear to me why compact tissue dies; it has so few osteogenitic cells, The medullary tissue lives because it is comparatively rich in osteogenitic elements. Why does bone die when the periosteum is stripped off? Because the resulting inflammation is so severe that the inflammatory tissue strangulated the osteoblasts in the Haversian canals. With antiseptic means we now control the inflammation, and the osteoblasts are not killed, and the bone is saved.

We are very hard, nowadays, on the periosteum. The fibrous layer has nothing to do with bone repair, but its osteoblastic layer is in direct communication through the lining of the Haversian canals with the medulla; it is practically one structure; and thus, if we look at this matter from the standpoint of a correct histology, we find that both views are correct, provided only that we have a distinct understanding of what is meant by the word periosteum in each case.

As to Dr. Miller's cases, I cannot agree with him as to what formed the bone in the case of total excision of the diaphysis of the tibia. While the shaft was dying, new bone was formed by the deep layer of periosteum, but after that the medullary spaces of the involucrum completed the bone.

I would also take exception to Dr. Robert's proposition to scrape the button of bone and turn it inside out, in the case of trephining the jaw for neuralgia. By this process he would remove all the osteoblastic cells, and the compact tissue would have a very good chance of dying. One reason for failures in operations about the lower jaw, is that it contains so little true medullary tissue, while, on the contrary, we can replace trephine buttons in the skull and have union, because the skull contains a large amount of such tissue.

I think Dr. Stubbs need not blame himself for his practice in resecting in military surgery. The necessary condition to bone repair is that absence of suppuration afforded by antiseptic methods,

and under the conditions present in the operations he speaks of he did right. And, to-day, he does right in trying to save the bone. In each case he takes the proper course in relation to all the circumstances, and that is all anyone can do.

The case of Dr. Agnew, referred to in the paper, occurred some twenty odd years ago. I saw the operation. The wound was completely covered by granulations. The fact that a denuded external table did not always necrose was known to Potts, and to all the older as well as modern surgeons, and had not Ollier led us astray by grafting, by insisting upon the periosteum being the sole osteogenetic agent, ignoring the fact that in removing it a layer of cells identical with those of the medulla are torn off, I think we would have arrived at a correct practice sooner. But surgeons went wrong by authority of Ollier, as they are now going wrong in the other direction by authorthority of Macewen.

In regard to the implantation of dead teeth, which Dr. Roberts refers to, the principle is probably the same in the bony pegs we used to employ for ununited fractures. They are hollowed out by the granulation tissue which develops into a fibrous or even osseous tissue, and so holds the tooth in place by these newly formed digitations.

About twelve years ago I exhibited to this Society a case in which I resected 4½ inches of the humerus, and about 2½ inches were reproduced from the sawn end. This was without antisepsis. In the case referred to by Dr. Miller, where I drilled the ulna, I am sure that the bone granulations fused with those of the soft parts for these reasons: the shell of bone when detached was not more than one-fourth the thickness drilled through, while the new bone was nearly as thick as the ulna of the other side, as the cicatrix was not materially depressed. A recent experience in a case of knee-joint excision induces me to recommend that instead of wiring fragments of bone we nail them together; after having previously drilled, or not, according to circumstances, allowing the heads of the nails to project through the skin. We thus save trouble and avoid damage in the removal.

DR. ROBERTS: Dr. Nancrede misunderstood me in regard to scraping away the cancellated tissue in reversing the plug in the case of trephining of the lower jaw. I would scrape only what he calls the fibrous periosteum from the button, and from the bottom of the pit in the jaw I would take away the cancellated structure sufficiently to remove all trace of the nerve canal. The two raw surfaces would be placed together, and, by sinking of the button, would be a solid bony plug, interposed between the nerve ends.

DR. MILLER: I do not see any advantage in reversing the plug over rotating it. The groove being at right angles to the course of the nerve, the part in coutact with the nerve is still solid bone, and the groove does not matter at all. In relation to the tibia case, the reason I emphasize the fact that the repair took place from the periosteum, is because there was entire death of the old bone with the involucrum, and the periosteum did not die.

Suffolk District Medical Society.

SECTION FOR CLINICAL MEDICINE, PATHOLOGY AND HYGIENE.

Stated Meeting, May 9, 1888.

ALBERT N. BLODGETT, M. D., SECRETARY.

DR. C. P. PENGRA presented

A CASE OF ATHETOSIS.

Athetosis is the name of a disease that was first recognized and named by Dr. W. A. Hammond, of New York, in 1871. It is characterized by an inability to retain the fingers and toes in any position in which they are placed, and by continual motion.

Since his first paper in 1871, there have been thirty-eight cases reported from Europe and eight from the United States; and it is this rarity of its occurrence that has induced me to present this case to this Society, with the hope that it may aid in clearing up the obscurity that surrounds its etiology, pathology, treatment and claims as a definite disease.

In all of his writings Dr. W. A. Hammond claims that athetosis is a distinct disease, and, while admitting its analogy to chorea and cerebro-spinal sclerosis, does maintain that it is independent, and can be so diagnosed. In this he is supported by Greidenberg, in *Vratch*, who goes even farther, admitting that it is not necessarily a result of hemiplegia, but may even be idiopathic.

Opposed to this view are Putzel,[1] Sturges,[2] Leube,[3] G. A. Hammond and Birdsall,[4] and others.

In all cases reported, there has been noted, at some previous period, a history of epilepsy, chorea, hemiplegia, or other cerebral disturbance; while the case of Leube, after having had athetoid movements for four years, actually developed into, and continued as, ordinary severe chorea. The history of the present case is no exception to the rule; and, considering the lesions most often found in post-mortem examinations, it seems that we are forced to believe that athetosis is too intimately allied to chorea, hemichorea, and the like, to merit its claim of being distinct. The lesions found are in the corpus striatum, optic thalmus, or both, and the cortex cerebri, and are the same as occur in the allied troubles. My diagnosis de-

[1] Op. Functions Nervous Diseases.
[2] Lancet, March 15, 1879.
[3] Deutsch. Arch. für Klin. Med., p. 242, 1880.
[4] New York Academy of Medicine (Neurol.), October 8, 1886.

pends upon the facts, that, in this case, the spasms are limited to the right hand only; that they are uniform, slow and quiet; that the muscles contract or extend together, and are firm and tense; that there is no trembling in any position of the hand or body; that the muscles of the arm are well developed; and that there is no scanning in speech. Hysteria is eliminated by the age at which it began and by the present condition of the patient.

Mrs. Anna B. Grover, age twenty-two, born in Marshalltown, Pa. Her family history is very good, excepting slight rheumatic attacks in the father's later life, and paralysis agitans in one aunt.

Her own health has been exceptionally good, with the following exceptions received from her father:—

"Anna was healthy, and perfect as could be until about two and one-half years of age, when a servant girl caught her by the arm, and tried to pull her up stairs. A physician was called, and pronounced it a bad sprain. After the usual bandaging and carrying in a sling for two weeks, it seemed as well as ever. About three months afterwards, having eaten heartily of green Lima beans, pods, etc., in the garden, she was taken at night with violent spasms, purging and vomiting, followed by great prostration, emaciation, unconsciousness, and paralysis of said arm, and also of speech, that continued for three months. During the sickness she was almost continually in motion, even after getting up. Her voice was entirely gone, and the arm now affected was useless. Many different doctors and treatments were employed. The voice gradually returned, and the arm improved. At first the hand was strongly contracted and painful. The arm was carried behind her back, through shame, till about the thirteenth year, which produced a lateral curvature, for which a brace was worn eighteen months. All improvement has been from the shoulder towards the hand. Electricity seems to have done the most good."

Present Condition.—Her general health is of the best, since the foregoing. "The hand," as she calls it, is not at all painful: there is no movement at night, or unless her attention is called to it, or she is excited. A decided effort of the will has only the slightest effect upon its movements. At times it contracts powerfully enough to tear a glove: to open it, she must use her left hand, and forcibly extend the fingers to their utmost. When left alone, the contracted fingers will return to normal in from two to five minutes.

In most of the reported cases the movements have been most marked in the thumb and little finger. In her case the thumb and first finger are most affected. The first finger is often forcibly extended, while the others are as strongly contracted. The hand is of little use, as there is no telling when it will take hold or let go. At present she is under no treatment, and is impressed that it is slowly improving.

In all cases the most improvement has been from electricity; and, contrary to theory, the faradic current has proved the more useful. No cure has been reported; and, while the trouble is regarded as incurable, it has never been known to prove fatal.

DR. J. J. PUTNAM asked: Are the reflexes of the lower extremity altered?

DR. PENGRA: Not at all. There seems to have been no trouble with any part of the body except the arm and the vocal organs. The lima beans were regarded as a poison by her parents, but from her history she undoubtedly had an attack of gastro-enteritis.

DR. PUTNAM: Are the muscles of the right arm hypertrophied?

DR. PENGRA: There is no enlargement that I know. The muscles seem stronger. They are set and tense.

DR. HAMILTON OSGOOD: What is the condition of the hand in the night?

DR. PENGRA: Quiet. She has never had a contraction in the night. There was a time, a considerable time ago, when she had slight contractions, I believe, but at no time has she had contractions since she has known anything about it.

DR. PUTNAM: I would like to say only a few words about the case; it is an interesting one. I suppose that it is very difficult, almost impossible, to draw any sharp dividing line between these disorders of movement. Dr. Gowers wrote, so far as I know, the most satisfactory paper on the subject a few years ago, and showed how one could trace gradual degrees of difference in these cases through the whole scales from the typical athetosis to even, he thought, as far as the late rigidity of hemiplegia; but without going so far as that, it seems very certain that there is only a sliding scale between the typical cases of athetosis and what has been known under the name of post-hemiplegic chorea; the difference consisting partly in the character of the movements, and partly in the fact of the greater or less amount of paralysis associated with them.

I was rather surprised to hear the Doctor say that so few cases have been reported, for I should not say that it is very rare to find cases that are as typical as this case. I would not speak of this as an absolutely typical case, because, as a rule, the movements would not stop in the typical cases when the patient was holding the arm at rest with the hand supported with the other hand, as at present; and then the movements are usually much more varied in character, involving extension quite as much as flexion, so that the fingers are thrown about in a worm-like action all the time, while here the flexion predominates, and

the flexor spasm is much more marked, I should say, than in typical cases of this disease. However, I do not see how it can come in any other category than that of one of the involuntary disorder of motion of that type.

DR. PENGRA: In regard to the number of cases I referred merely to the number of cases recorded. I have no doubt that there are plenty of cases, as we are quite aware, in most any line of disease, that, while not being recorded, have existed. We must realize that only in 1871 the disease was recognized as such. From the literature that I can read—of course my experience has not been sufficient to warrant my statement—but from what I can read I am inclined to think that athetosis is an organic disease. I think I so stated in my paper. The disease I do not think I stated as a typical one, from the peculiarity of the motion.

The definition that Hammond gives is "a disease characterized by an inability to control the fingers or toes, and a continual motion." And in his reports of the cases, and he is the father of the disease, you might say, as far as the diagnosis is concerned—in the reports of his own cases there has been such a marked remission that almost the first thing that I thought of in connection with the definition was the superfluousness of the word "continual." During the greater part of the time that my patient was suffering from the trouble, and the paralysis, which seemed to have been the precursor of the disease, she was in constant motion, that included a large portion of the body, I believe mostly on the right side, but the paralysis was limited to the right arm. The motions of the arm did include movements toward the back to such an extent that she finally put it on the back and left it there.

I do not think I referred to the case as being exactly typical; so far as I can see there is no typical athetosis.

My statement suggested as strongly as I could state from my knowledge of the cases, that it is an organic cerebral disease. The statement of Driedenberg (?) is the one statement that counteracts all others so far as it goes, to the effect that it may be idiopathic, but his own case does not sustain that, inasmuch as one of his cases were preceded by hydrocephalus and another case by epilepsy; and as to the matter of the word "continued," it is certainly not right, because there have been no cases recorded where remissions have not occurred.

DR. C. F. FOLSOM: It seems to me, Mr. Chairman, that it is a very interesting case, and that we want to understand in regard to a good many points what we cannot make out to-night before calling it clearly a case of athetosis. If it is athetosis it differs in a great many essential respects from what is called typical athetosis. It is a question, of course, how far these movements of this sort can be considered as belonging to that group, and due to organic trouble. There doesn't seem to me any marked hypertrophy of the hand, and the movements seem very different from the movements of athetosis; the flexor muscles contract almost instantly, as soon as the resistance is taken away. It is quite possible that there may be a little difference in the knee-jerks. The whole group of cases is certainly a very interesting one. I suppose that nobody is satisfied in his own mind just what to call athetosis, and what not, but the fact of the hand being quiet during sleep, and perfectly quiet so long in the position that the patient has it now, seems to me to make it very unlike what is described as athetosis.

DR. PENGRA: Would the Doctor suggest some name for it?

DR. FOLSOM: As I say, I would not wish to express an opinion without having it under observation some time. It reminds me of a case that was in Dr. George B. Shattuck's ward in the City Hospital, which suggested athetosis. Strangely enough a case of real athetosis was in the ward at the same time. The former had these features of being quiescent during sleep with no hypertrophy of the muscles, and the contractions of the muscles were sudden and violent and quick, instead of slow and gradual, and there was the feature of quietude for a long time. It was finally thought to be a functional trouble, and in the course of time, by rest, and cod-liver oil and tonic treatment, it almost entirely disappeared. It seems to me it is a difficult matter, sometimes, to make a diagnosis between the various forms of anomalous chorea and hysteria and athetosis.

DR. PENGRA: I would say that according to the best authorities that I can find on the subject of diagnosis—that is, in print—this is the essential feature, which I quote from Dreidenburg, "that there is no trembling in any position of the hand or body; that the muscles of the arm are well developed, and there is no scanning in speech; that the movements are uniform and slow and quiet; that the muscles contract and extend together, and are firm and tense."

DR. FOLSOM: He evidently has in mind, I think, disseminated sclerosis, in his diagnosis; in regard to the scanning of speech, etc.

DR. PENGRA: I don't pretend to be an authority on the subject at all. I brought it before the Society to hear some opinions beside my own. Experience, of course, would be a teacher that a young man could not get from books. In regard to the treatment of the true athetosis, there was one writer, in fact this same Dreidenburg, who stretched the medium nerve, but he finally had one case where he stretched the nerve and the nerve remained stretched, and as in no previous case he got any result that lasted more than eight days, he finally gave that up, and resorted to electricity entirely.

(To be concluded.)

DOMESTIC CORRESPONDENCE.

LETTER FROM NEW YORK.

(FROM OUR OWN CORRESPONDENT.)

Surgical Aid in the Treatment of Pulmonary Disease—Surgery in Laryngeal Phthisis — Surgery in Pneumonia; in Pulmonary Abscess; in Tubercular Cavities; in Pulmonary Tuberculosis.

The discussion on *Surgical Aid in the Treatment of Pulmonary Disease* at the June meeting of the Fifth District Branch of the New York State Medical Association was opened by a suggestive paper from Dr. N. L. North, consulting surgeon to the Methodist Episcopal Hospital of Brooklyn. At the outset he said that he was aware that comparatively few clinical facts could be produced upon which to base an argument, and such a discussion must, of necessity, be somewhat speculative. It was as yet a matter only in contemplation, though perhaps an event to come, for the surgeon to have the temerity to amputate a tuberculous larynx, or to make a door in the chest cavity and, having rid a lung of its tuberculous or diseased portion, obtain by careful antiseptic or aseptic dressing union of the remaining parts, and subsequently transfer the patient to the physician for medical upbuilding and convalescence. It was a fact, however, that notwithstanding the better knowledge of the pathological conditions and hygienic needs in diseases of the lungs, the treatment pursued was altogether unsettled and unsatisfactory, and without marked results. Phthisis attacked its multitudes now, as in the ages past, and multitudes succumbed to it in spite of medicine, hygiene, change of climate, and a largely increasing list of new remedies; and even the acute affections of the organs of the chest proved fatal at the present time in nearly, if not quite, as large a percentage as formerly. At this juncture, with the thought of what surgery—modern, antiseptic surgery—has accomplished in other parts of the body in alleviating and curing diseases and injuries heretofore thought to be fatal, and only fatal, in their tendencies and results, it seemed reasonable to turn our attention to the subject of surgical aid in chest diseases.

The first affection considered was pneumonia, and in this he expressed the opinion that it would be wise in many cases to return to the old minor operation of phlebotomy. "In the first, or congestive stage," he asked, "when the lung is literally blocked up and the right side of the heart filled to overflowing with blood, is it not more rational to abstract the blood by venesection, if need be, or even by direct aspiration from the right ventricle, and so relieve the obstructed lung and the engorged heart, than to attempt to force the organs to accomplish an impossibility by the stimulating plan so common in what is now called the supporting treatment? The fear of producing prostration by prompt radical treatment, as well in this disease as in some others, sometimes promotes, through improper attempts at stimulation, the very engorgement and consequent prostration it is desired to avoid."

It is perhaps worthy of note that quite a number of the speakers who took part in the subsequent discussion also spoke with favor of a return to the practice of venesection in many cases in the first stage of pneumonia.

Again, in pneumonia, he went on to say, the patient having passed the dangerous point of engorgement, and the changes of the second and third stages tending to resolution having failed to occur, so that a condition of suppuration and breaking down of the lung, or perhaps gangrene, has supervened, it would seem eminently proper that surgery should be called in to assist in the treatment, and an attempt, at least, be made to arrest the almost certain progress of the disease to a fatal termination. To make an opening through the chest wall with the view of draining the pus cavities or boldly removing, if need be, the diseased or gangrenous portions of the lung itself, would, with proper precautions, antiseptic and otherwise, appear possible, and to afford a reasonable prospect of good results. Chronic abscess, he continued, had already been relieved by surgical procedure, and the question remaining for decision in regard to this was how best to supply the relief, whether by resection of one or more ribs and a large, free opening, or by a valvular outlet. It had occurred to him that with a device containing a ball-valve the passage of fluid might be made comparatively free, while the passage of air inwards could be practically prevented.

Laryngeal phthisis offered to the surgeon opportunities for testing the resources of his art with fair hope of favorable results, since operative procedures for the arrest and, in some cases, apparently permanent cure of epitheliomatous, carcinomatous, and other malignant diseases of the larynx had already been reported. The probabilities would encourage a resort to either partial or entire laryngectomy, and especially in view of the fact that laryngeal tuberculosis not infrequently proceeded almost to its fatal termination without the lungs having been invaded by the disease.

Having made some general remarks to the effect that surgical wounds of the lungs and pleuræ were less dangerous than was generally supposed, Dr. North made the somewhat startling suggestion of completely removing the apex of a tuberculous lung at an early period, before the disease had spread to other portions of the lung or involved the opposite lung or other organs. This idea, he said, was one which had occupied his mind considerably of late, and was in line with the recent practice of removing tuberculous glands, joints,

etc. The details of an operation to reach and remove a lung apex would be slightly different in the two sides on account of the difference in the origin and course of the right and left subclavian artery. Such an operation would be almost identical in its general features with that for ligating the subclavian, except that after the vessel was reached it, with the accompanying rim and veins, would be lifted back with a blunt hook. After the application of suitable clamps, to prevent hæmorrhage or the egress or ingress of air, would follow the ablation, with the knife or scissors, of the diseased portion of the lung. The lung and pleural wound would then be closed with the continuous catgut suture, and the whole allowed to drop back into the chest cavity; after which, with the utmost care as to drainage, etc., the external incision would be closed. Very possibly in some cases the clavicle would have to be sawn in two and turned back; while in others the first rib might have to be exsected in order to secure sufficient room for reaching and manipulating the lung apex. Perhaps in other cases, again, a posterior operation, involving the exsection of the first and second ribs posteriorly and the pushing aside and downward of the scapula, might prove the most feasible method. In either case the object of the radical procedure referred to would be the cure of the disease, or the prevention of general tuberculosis by an early removal of the nidus of the tubercle bacilli.

In concluding Dr. North propounded a number of questions which were taken up *seriatim* by Dr. Joseph D. Bryant, who read the next paper.

(1.) *Can surgery be made available in the treatment of pneumonia or other acute affections of the lungs, and if so, how?* The foundation of rational medicine and surgery, Dr. Bryant said, rested on the detection and removal of the causes of disease. Hence, before inquiring what surgery can do for the relief of these conditions, it seemed proper to inquire first how surgical skill could prevent them. The exact nature of acute pneumonia, whether it were a local disease or a local ramification of a constitutional disease, was not as yet determined. Surgery could not, therefore, exercise a rational preventive influence against this disease; nor could he comprehend how operative surgery could exercise a practical influence in relieving a patient from the full effects of an attack of it. As to traumatic pneumonia, he did not feel that he could add anything to what had already been published in the various standard works on surgery.

(2.) *Can surgery assist in the treatment of abscess of the lung; and what is the safest and most effectual mode of reaching, evacuating and draining the abscess?* In abscess of the lung surgery could and did afford efficient assistance, and Hippocrates himself had laid down the surgical principles of treatment in a clear and satisfactory manner. The greater part of Dr. Bryant's paper was taken up with an admirable description of the methods now in vogue among the best surgeons for the diagnosis and treatment of this class of affections, and at its conclusion he stated that Professor Roswell Parker, of Chicago, had reported 40 cases in which pneumotomy was performed for the relief of bronchiectatic and tuberculous abscess, with the following results: 23 bronchiectatic abscesses, with 9 deaths; 13 tuberculous abscesses, with 6 deaths. In 32 cases of hydatid cyst treated in a similar manner there were 4 deaths.

(3.) *What surgical process, if any, can help in the treatment of laryngeal phthisis?* In an advanced stage of the disease obstructed breathing and expectoration not infrequently occurred; and he said he had in mind a case of this kind at Bellevue Hospital which Professor Janeway transferred to his care for relief from these symptoms by tracheotomy. The operation not only relieved the patient of obstructed breathing, but also at once afforded a free escape through the tube of purulent matter from the lungs. In this case the upper extremity of the trachea was nearly occluded by ulcerating granular growths, and it appeared that he would have rendered the patient a more complete and lasting service than was possible by tracheotomy by splitting the larynx in the median line anteriorly and removing the diseased contents. A step of this kind could not, however, be taken consistently except the prognosis were bad in all respects. The surgical measures that were now employed in other conditions of phthisical larynx belonged more properly to the domain of specialists in laryngology.

(4.) *Can surgery be made effectual in draining tubercular cavities, and how?* Such cavities could be opened in a manner similar to that described for abscess of the lung, and the precautions enjoined in the latter instance should be sedulously observed. It was undoubtedly true that the disinfection and drainage of tubercular cavities would in many instances cause a marked alleviation of the symptoms; but it was hardly to be expected that a cure of the local tuberculous condition could be effected, since the specific growths are too far disseminated from the abscess wall, and often made up such a large proportion of its structure that little, if any, direct curative influence could be exerted. A tuberculous ulcer of the integument—one that could be treated directly and with vigor—exhibited a degree of perverseness to the effect of both medical and surgical measures that portended illy for the successful treatment of a similar disease of the pulmonary tissue.

(5.) *Is it possible by surgical process to reach and destroy, by antiseptics, germicides, or otherwise, the bacillus tuberculosis, or whatever is the cause of phthisis pulmonalis?* This question, he said, had already been answered under the fourth. The injection into pulmonary tissue and pulmonary cavities of substances destructive of the tubercle

bacillus could be indulged in if one felt inclined to make the attempt; but to consider it possible to cure in any appreciable degree the tuberculous condition itself by any such measure, seemed to require a large increase of faith, with a corresponding loss of judgment. He did not think it proven to the satisfaction of competent physicians that the injection of antiseptic fluids into tubercular lung cavities has been productive of practical good; while the dangers attendant on the general acceptance of such a measure would undoubtedly constitute a great evil.

Dr. Avery Segur, of Brooklyn, referred to the results obtained in cases of bronchiectasis by Dr. Theodore Williams and Mr. R. J. Goodlee, of London, and quoted the conclusions arrived at by the latter in regard to the surgery of the lungs. He also stated that Dr. Williams had for a considerable time been employing antiseptic injections at the Brompton Hospital for consumptives, and that the results obtained by him, as well as other observers, both in England and this country, had been such as to encourage further trial of the method in suitable cases. The injection of pulmonary cavities was found to be perfectly possible, and attended with great amelioration of the symptoms in many instances.

Dr. Bailey, of Brooklyn, spoke of the benefit which he had seen derived from such injections in five old hospital cases of phthisis; there being diminution of the cough, expectoration and night-sweats. Half a drachm of a five per cent. solution of carbolic acid in glycerine was injected every day, or every second day, and the procedure was entirely painless.

Dr. C. S. Wood, of New York, gave a *résumé* of the results obtained by Goodlee, Runeburg, and other investigators in this field, and having referred to the plan proposed by N. Riva, an Italian surgeon, for treating tuberculosis by injecting antiseptic fluids into the pleural cavity and completely flooding the diseased lung, stated that in summing up the observations and reports thus far made we might safely draw the following conclusions: In abscess of the lung, whether gangrenous or not, it is advisable to first aspirate the cavity, and then inject, at the same time and through the same puncture, an antiseptic fluid. If the abscess refills the operation must be repeated. When a foreign body is supposed to be lodged in a bronchus an opening should be made into the lung by the resection of a portion of one or more ribs, under strictly antiseptic precautions, and the foreign body removed. That the latter operation was attended with but little danger Dr. Wood said was abundantly demonstrated by the results of many similar operations during the late war. But with our present knowledge there was but little encouragement in any surgical operations upon the lungs for phthisis; and the reason why surgery was so impotent in this field was not difficult of comprehension. Tubercles were not confined to any one portion of the lung, although the aggregation was usually greater at the apex than elsewhere; and before a cavity requiring surgical treatment had been formed, other portions of the lung, as well as other organs, were usually involved.

Drs. Leale, Truax, Barnes, McCullom and Squibb also took part in the discussion, and in bringing it to a close Dr. North spoke of the probable local character of tubercular disease in the early stage, just as in the case of cancer. He thought that we need not feel discouraged because the reports of the surgical procedures referred to were not as yet very favorable. If there was any hope of success whatever, we must still persevere, as the alternative was death. The phthisical patient should not be abandoned to the surgeon; but the surgeon and physician should unite together in the treatment. P. B. P.

BOOK REVIEWS.

A Manual of Diseases of the Nervous System. By W. R. Gowers, M.D., L.R.C.P., etc. American Edition issued under the supervision of the author, and containing all the material of the two-volume English edition with some additions and revisions, with 341 illustrations. 8vo, pp. 1,357. Philadelphia: P. Blakiston, Son & Co. 1888. Chicago: W. T. Keener.

Dr. Gowers' numerous contributions to medical literature and his former smaller works upon the diagnosis of diseases of the nervous system, have made him well known to the profession as a clear and exact as well as an interesting writer. From the present volume we expected much and have been in no way disappointed. It is probably the most comprehensive manual upon the subject in our language. Each topic is discussed with well-proportioned fullness. The descriptions are clear and accurate and not at all diffuse.

The author says in his preface that the object of the work is "to afford the student the means of gaining an adequate conception of our present knowledge of the diseases of the nervous system, and to supply the practitioner with the information he needs for dealing with these diseases in his daily work." The book will accomplish these objects better than any other at our hand. The clearness of Dr. Gowers' descriptions of symptoms of diagnostic value is particularly commendable.

A reader is surprised, however, at the rare references that are made to authors and experimenters. While this is disadvantageous to those who make nervous diseases a specialty and are endeav-

oring to cover the whole literature of the subject in their reading, it tends rather to gratify the student and fix definitely ideas in his mind by teaching him *ex cathedra*.

The illustrations are numerous and for the most part very satisfactory. A few that are evidently made directly from photographs of patients are artistically poor, and some of them do not make clearly evident the object to be illustrated. It is to be hoped that in future editions these cuts will be replaced by better ones.

The first sixty pages are devoted to general symptomatology. In the next sixty pages diseases of the nerves are described. Following this subject 325 pages are devoted to diseases of the spinal cord. The next 500 pages are allotted to diseases of the brain, and the remainder of the work to general and functional diseases.

MISCELLANEOUS.

AMERICAN ORTHOPEDIC ASSOCIATION.—*Preliminary Programme of the Meeting to be held in Washington, September 18th, 19th and 20th, 1888.*

1. Newton M. Shaffer, New York, "The Modern Treatment of Chronic Joint and Spinal Disease."
2. V. P. Gibney, New York, "Immobilization in Articular Disease." Report on the Treatment of Club-foot by means of the Thomas wrench, or the "T. T."
3. Henry L. Taylor, New York, "Mechanical Treatment of Senile Coxitis."
4. A. B. Judson, New York, "A Practical Point in the Treatment of Potts' Disease of the Spine."
5. C. F. Stillman, New York, "An Efficient and Inexpensive Method for the Mechanical Treatment of Potts' Disease."
6. John Ridlon, New York, "Rest, in the Treatment of Chronic Joint Diseases."
7. Dillon Brown, New York, "Acute Epiphysitis in Infants."
8. Samuel Ketch, New York, "Remarks on Lateral Curvature and its Early Treatment."
9. DeForrest Willard, Philadelphia, "Osteotomy for Anterior Tibial Curves."
10. T. G. Morton, Philadelphia, "Description of an Apparatus for Measuring any Inequality in the Lower Extremity."
11. Benj. Lee, Philadelphia, "Hæmatoma Oris, as a Sign of Injury to the Spine in the Superior Cervical Region."
12. A. J. Steele, St. Louis, Mo., "Two Knee-joint Excisions."
13. H. Hogden, St. Louis, Mo., "Report on Morton's Operation for the Immediate Reduction of Club-foot."
14. Ap. Morgan Vance, Louisville, Ky., "Femoral Osteotomy."
15. Geo. W. Ryan, Cincinnati, Ohio, "A Case of Reflex (?) Valgus."
16. W. R. Whitehead, Denver, Colo., "Remarks on the Operative and Mechanical Treatment of some Joint Diseases and Injuries; with especial reference to the Hip, Knee and Elbow Joints, with Illustrative Cases."
17. E. H. Bradford, Boston, Mass., "Analysis of Treatment of Seventy Cases of Club-foot."

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285 Fifth Avenue, New York.

SIMPLE TESTS FOR POISONOUS CANDIES.—The *American Analyst*, of March 15, 1888, writes that to test candy with respect to poisonous colors one needs a few ounces of alcohol, about an ounce of bleaching powder in solution (hypochloride of calcium), a little white woollen yarn, and a small bottle of aqua ammonia. See first whether the color can be dissolved out by alcohol; if it can, immerse the woollen yarn in the solution, and should the color adhere to the yarn and dye it, the probabilities are that it is a coal-tar color; if a red, it may contain arsenic. If the alcohol produces no effect, apply a drop of the bleaching powder solution to the surface of the sweetmeat; if the color fades out it is probably of vegetable origin and harmless.

"The poisonous color most frequently used is chrome yellow, a compound of chromium and lead. Its presence may be strongly suspected if the following tests have shown that none of the harmless yellows have been employed. The harmless yellows most commonly employed are turmeric, a vegetable color made from the root of a certain herb, fluorscein, a coal-tar yellow, and a number of vegetable yellows. Turmeric turns red when treated with ammonia. The other vegetable yellows fade when treated with the solution of bleaching powder. To detect fluorscein dissolve the candy in a tumbler of water and view the water in the sunlight against a black background. If fluorscein has been used, the green fluorscein will then be seen. When the tumbler is held between the eye and the light the color of the water appears yellow. If no results are obtained by any of these tests the suspected candy is probably colored by chrome yellow and is poisonous. Burnt umber, an iron-bearing earth frequently used to adulterate chocolate confections, may be detected in this way: Dissolve the confection in a glass of hot water; if a brown gritty residue remains undissolved on the bottom the presence of the umber is indicated."

WATER FOR LIVERPOOL.—Note is made of a stupendous plan for supplying the city of Liverpool with water, says the *Sanitary News*. It involves the removal of a whole Welsh village, including woods, cottages, churches, etc., this immense space to be devoted to a reservoir four and one-half miles long by half a mile to a mile broad, and eighty feet deep. There are to be three lines of pipe, each sixty-eight miles long, with filtering beds and secondary reservoirs; and the cost of the aqueduct alone is estimated at $15,000,000.

Official List of Changes in the Stations and Duties of Officers Serving in the Medical Department U. S. Army, from August 11, 1888, to August 17, 1888.

Major J. N. Lauderdale, Surgeon U. S. A., July 28, promoted to Surgeon U. S. Army, with rank of Major, to rank from July 3, 1888.

Asst. Surgeon Joseph K. Corson, U. S. Army, leave of absence extended one month. Par. 17, S. O. 178, A. G. O., August 2, 1888.

Asst. Surgeon James C. Merrill, U. S. Army, granted one month's leave of absence from August 3. Par. 7, S. O. 178, A. G. O., August 2, 1888.

Asst. Surgeon John de B. W. Gardiner, U. S. Army, will on the expiration of his present sick leave of absence report in person to the commanding officer at Ft. Leavenworth, Kan., for duty. Par. 4, S. O. 178, A. G. O., August 2, 1888.

First Lieut. Charles F. Mason, Asst. Surgeon U. S. A., reappointed July 28, 1888, to rank from July 2, 1888. Reported for duty at Ft. Washakie, Wyo., August 2, 1888.

Official List of Changes in the Medical Corps of the U. S. Navy for the Week Ending August 11, 1888.

P. A. Surgeon H. W. Whitaker, detached from the "Mohican" and wait orders.

INFORMATION WANTED.

A correspondent wishes to get a work giving the treatment of genito-urinary diseases by electricity.